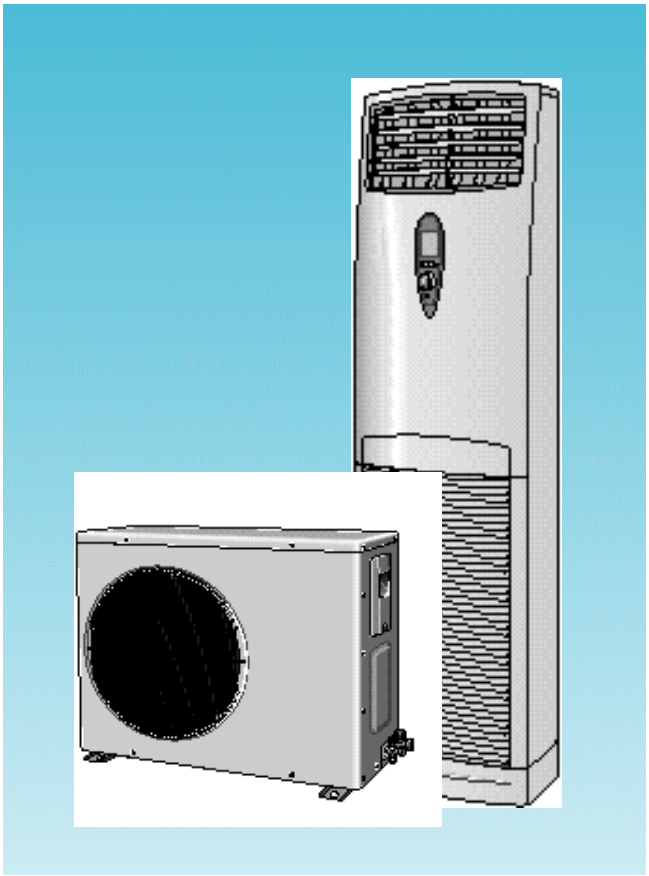
KLIMATAIR PLUS

PACKAGED AIR CONDITIONER

INDOOR UNIT **OUTDOOR UNIT**
KFH28PV2 **KRH28PV2**

SERVICE Manual

AIR CONDITIONER



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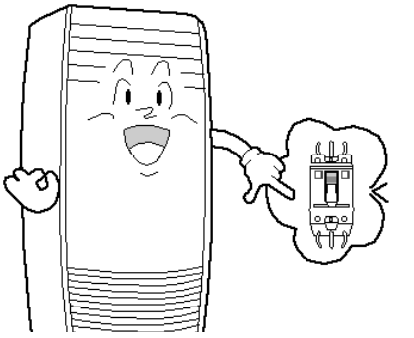
1. Precautions

1) Turn off the the power.
Be sure to turn off the power before attempting to repair the unit such as the disassembly of the unit.

Turn off the sub power switch separately installed.

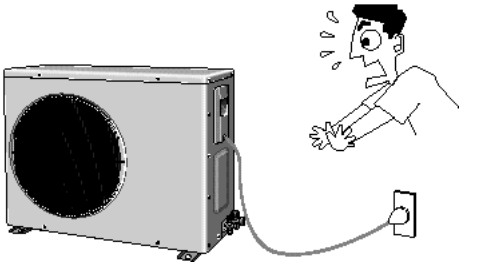


2) Be careful of electric shock
When checking the circuit with the power connected in unavoidable circumstances, take special care not to touch the live parts. There is a danger of electric shock.

3) Use of appropriate parts
Be sure to use the genuine parts of the relevant model when it is necessary to replace parts. (Replace parts instead of repairing with regard to the malfunctioning of electric contact areas. Never attempt to modify the unit. It is extremely dangerous for the consumer to attempt to repair the unit on his(her) own.)

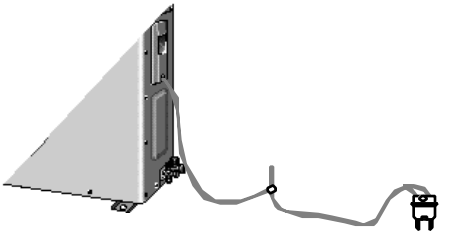
4) Use of proper tools
Use appropriate tools for repair, and use measuring equipment after accurate calibration. Using worn tools may result in problems, including poor contact and poor connection.

5) Avoid damage to electric wire or electric cord.
Check the electric cord or electric wire for any damage during repair.
Be sure to replace it if damaged.



No connection with the power receptacle

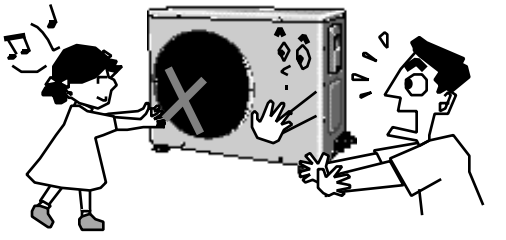
6) Avoid intermediate connection of the electric cord.
Never attempt to make an intermediate connection by cutting the middle area of the electric cord or make a connection to the power receptacle as it is very dangerous, causing problems or fire.



7) Checking of insulation
Be sure to check the insulation resistance after completion of the assembly work.
(Check whether the insulation resistance of the electric wire and grounding terminal is over 30MΩ by using the insulation resistance tester, and then connect the power source.)

8) Checking of grounding
Check the grounding condition, and perform repair if poorly grounded.

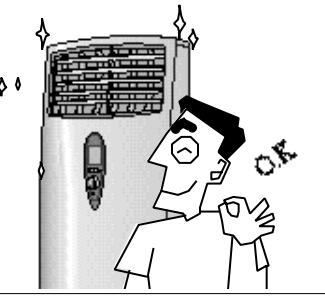
9) Checking of installation condition
Check the installation condition of the unit, and perform repair if there is any defective area.
If the unit remains in an unstable installing condition, install it at a new site.



10) Be careful of children
As the repair of the unit involves a lot of dangerous elements, do not allow children to approach nearby during repair work.

Cleaning

Upon completion of the repair, clean the air conditioner and surrounding area, and inform the customer of completion of the repair.



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2. Product Specifications

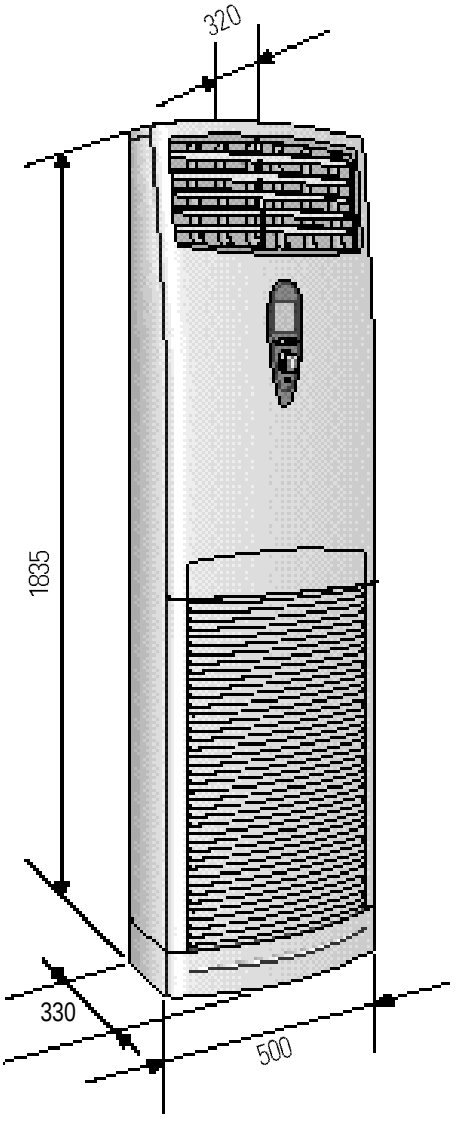
2-1 Table

Item			Model		KFH28PV2
Size	Indoor unit	Unit	Width x Height x Depth	mm	500 x 1835 x 330
		Packed	Width x Height x Depth	mm	574 x 1945 x 409
	Outdoor unit	Unit	Width x Height x Depth	mm	880 x 790 x 310
		Packed	Width x Height x Depth	mm	1023 x 851 x 413
	Piping	Packed	Width x Height x Depth	mm	640 x 130 x 640
Weight	Indoor unit	Unit		kg	42
		Packed		kg	49
	Outdoor unit	Unit		kg	67
		Packed		kg	75
	Piping	Packed		kg	12
Electric characteristics	1. Cooling capacity/Heating Capacity			BTU/h	25,800 / 29,800
	2. Power consumption(Cooling/Heating)			W	2,700 / 2.900
	3. Current consuption(Cooling/Heating)			A	12.5 / 13.5
	5. Noise (Cooling/ Heating)	Indoor unit	Turbo	dB	50 / 48
			High	dB	48
			Medium	dB	45
			Low	dB	43
		Outdoor unit		dB	59
Indoor unit	1. Evaporator		Construction	Row x Step	3 x 26
			Fin		WAVE 1.4
			Capillary tube		ø1.3 x L x 4
	2. Blower motor		No. of polarities		6P
			Capacitor		450VAC 4.5μF
			RPM	Turbo	750
				High	650
				Medium	600
				Low	550
	3. Blower		Type		SIROCCO
	4. Motor swing				220V/3W
	5. Fuse			V/A	250V 3.15A
Outdoor unit	1. Condenser		Construction	Row x Step	2 x 30
			Fin		WAVE 1.7
	2. Refrigerant volume		R-22	g	2,500
	3. Compressor		Maker		COPELAND
			Model		ZR34K3-PFJ
			Type		SCROLL
			Capacitor		450VAC 50μF
			OLP		-
	4. Fan motor		No. of polarities		6P
			Capacitor		450VAC 4.0μF
			RPM		840
	5. Fan		Type		PROPELLER
	6. Service v/v		High pressure side		3/8 inch
			Low pressure side		5/8 inch

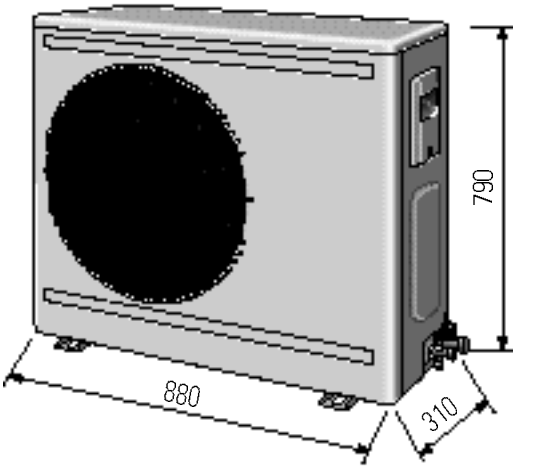
2-2 Dimensions

unit : mm

Indoor Unit



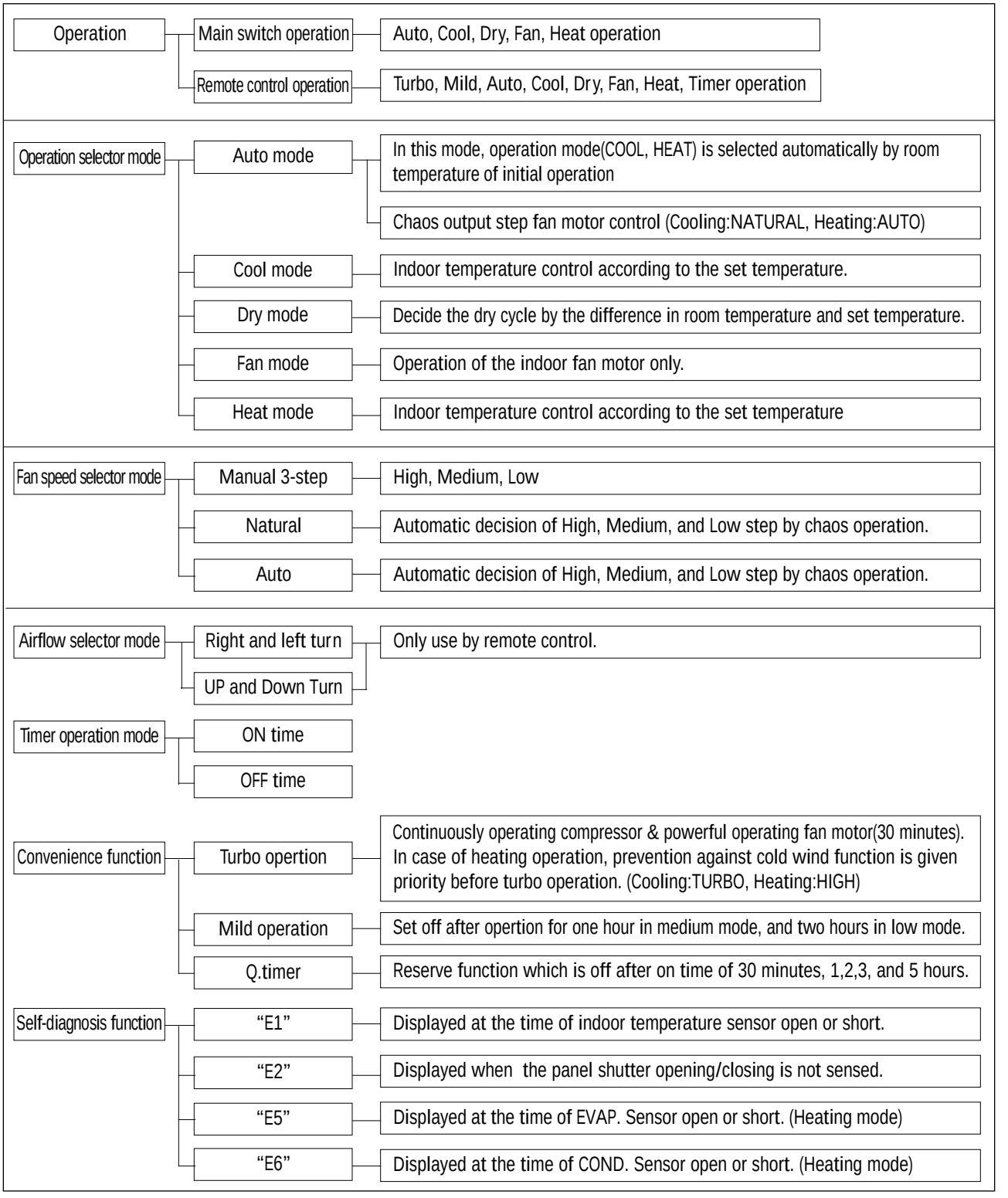
Outdoor Unit

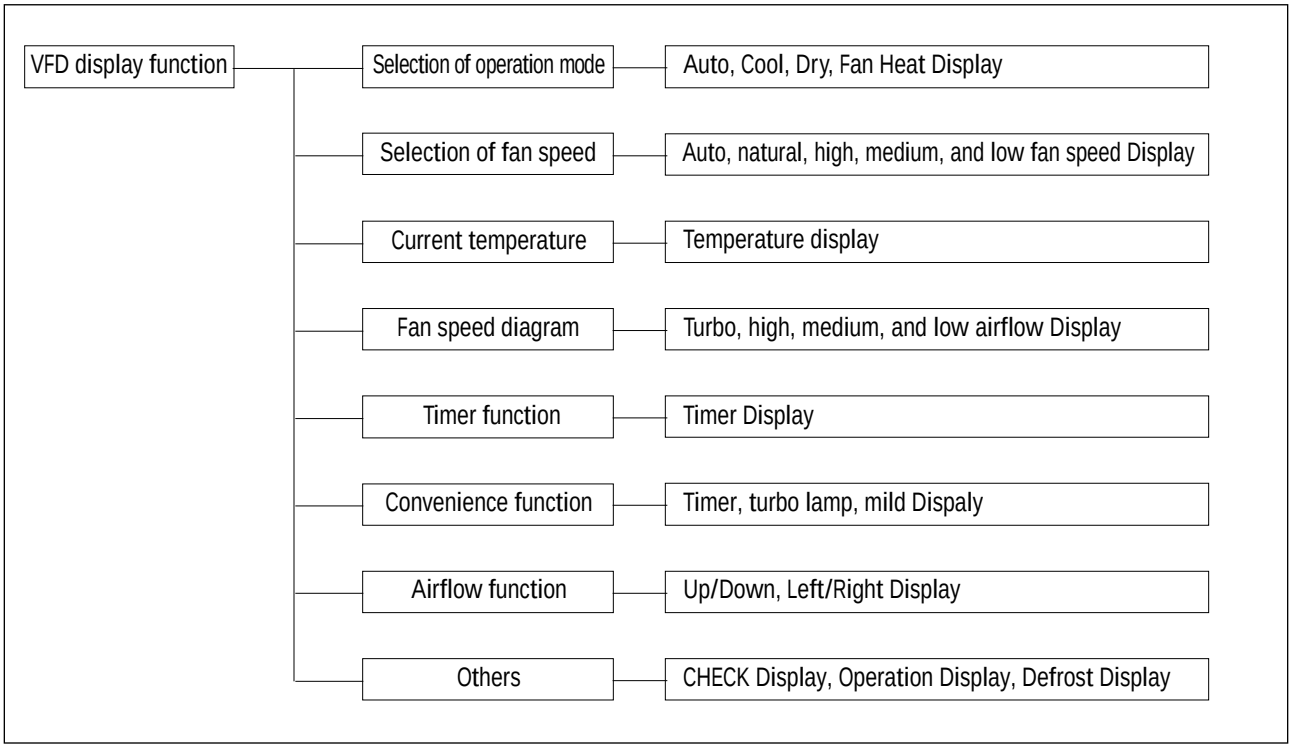


3. Operating Instructions and Installation

3-1 Operating Instructions

3-1-1 Control System Chart


Operation
Main switch operation
Auto, Cool, Dry, Fan, Heat operation
Remote control operation
Turbo, Mild, Auto, Cool, Dry, Fan, Heat, Timer operation
Operation selector mode
Auto mode
In this mode, operation mode(COOL, HEAT) is selected automatically by room temperature of initial operation
Chaos output step fan motor control (Cooling:NATURAL, Heating:AUTO)
Cool mode
Indoor temperature control according to the set temperature.
Dry mode
Decide the dry cycle by the difference in room temperature and set temperature.
Fan mode
Operation of the indoor fan motor only.
Heat mode
Indoor temperature control according to the set temperature
Fan speed selector mode
Manual 3-step
High, Medium, Low
Natural
Automatic decision of High, Medium, and Low step by chaos operation.
Auto
Automatic decision of High, Medium, and Low step by chaos operation.
Airflow selector mode
Right and left turn
Only use by remote control.
UP and Down Turn
Timer operation mode
ON time
OFF time
Convenience function
Turbo opertion
Continuously operating compressor & powerful operating fan motor(30 minutes). In case of heating operation, prevention against cold wind function is given priority before turbo operation. (Cooling:TURBO, Heating:HIGH)
Mild operation
Set off after opertion for one hour in medium mode, and two hours in low mode.
Q.timer
Reserve function which is off after on time of 30 minutes, 1,2,3, and 5 hours.
Self-diagnosis function
“E1”
Displayed at the time of indoor temperature sensor open or short.
“E2”
Displayed when the panel shutter opening/closing is not sensed.
“E5”
Displayed at the time of EVAP. Sensor open or short. (Heating mode)
“E6”
Displayed at the time of COND. Sensor open or short. (Heating mode)


VFD display function
Selection of operation mode
Auto, Cool, Dry, Fan Heat Display
Selection of fan speed
Auto, natural, high, medium, and low fan speed Display
Current temperature
Temperature display
Fan speed diagram
Turbo, high, medium, and low airflow Display
Timer function
Timer Display
Convenience function
Timer, turbo lamp, mild Dispaly
Airflow function
Up/Down, Left/Right Display
Others
CHECK Display, Operation Display, Defrost Display

3-1-2 Main Controller Function

3-1-2(a) Auto Operation

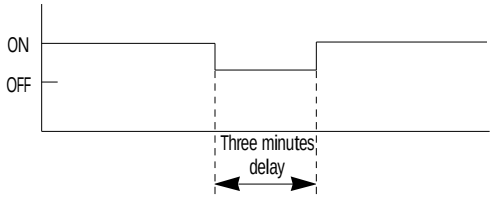
1. In this mode, operation mode(COOL, HEAT) is selected automatically by the room temperature of initial operation.

Room Temp.	Operation Type
Tr ≥ 21˚C + ΔT	Cool operation (Set Temp.:24˚C + ΔT)
Tr < 21˚C + ΔT	Heat operation (Set Temp.:22˚C + ΔT)

   ΔT=-1˚C, -2˚C, 0˚C, +1˚C, +2˚C
   ΔT is controlled by setting temperature TEMP. SET Key of remote controller.
2. In Auto mode, the optimum fan speed is selected automatically and cannot be changed.
   · Set the "Auto" for heating.
   · Set the "NATURAL" for cooling.

3-1-2(b) Cool Operation

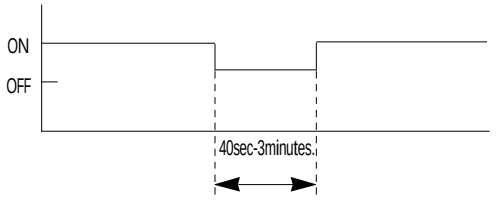
1. The compressor is automatically turned on / off by the difference between the current temperature and desired temperature.
2. By selecting the fan speed , the operation of "low", "medium", "high", "natural", "auto" mode is selected.
3. The compressor is turned on / off by the change of the current temperature.
   • The compressor is turned off when the current temperature is equal to the desired temperature.
   • The compressor is turned on when the current temperature is +1˚C of the desired temperature.
4. Desired temperature setting range : 18˚C ~ 30˚C it can be changed by the unit of 1˚C.
5. Three minutes delay operation of the compressor.



• **Three minutes delay setting condition**
  ①After power reset
  ②On again after compressor off

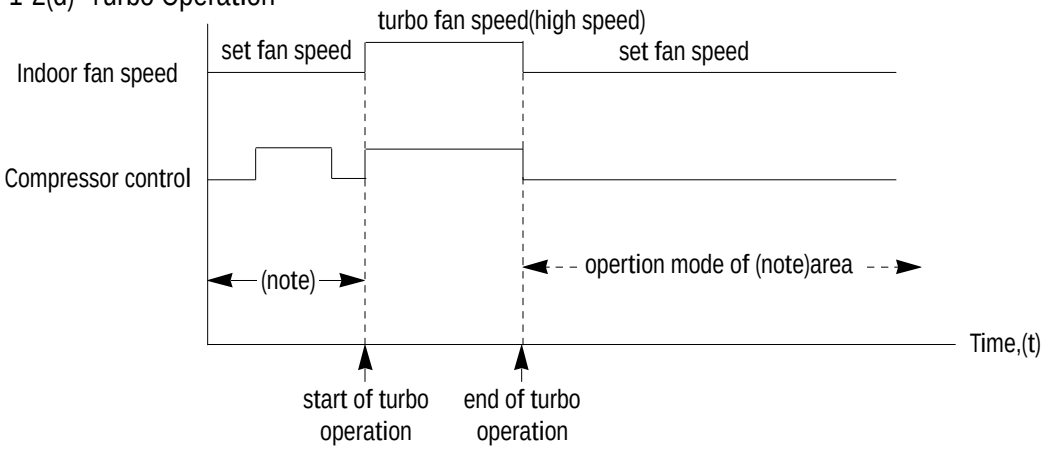
3-1-2(c) Heat Operation

1. The compressor is automatically turned on / off by the difference between the current temperature and desired temperature.
2. By selecting the fan speed , the operation of "low", "medium", "high", "auto" mode is selected.
3. The compressor is turned on / off by the change of the current temperature.
   • The compressor is turned off when the current temperature is +1˚C of the desired temperature.
   • The compressor is turned on when the current temperature is -1˚C of the desired temperature.
4. Desired temperature setting range : 16˚C ~ 30˚C it can be changed by the unit of 1˚C.
5. Delay operation of the compressor.



• **Delay setting condition**
  ①After power reset or shut down compressor by control the desired temperature:3minutes.
  ②After deice:40sec.
  ③After shut down compressor or 4-way valve:1 / 2minutes

3-1-2(d) Turbo Operation

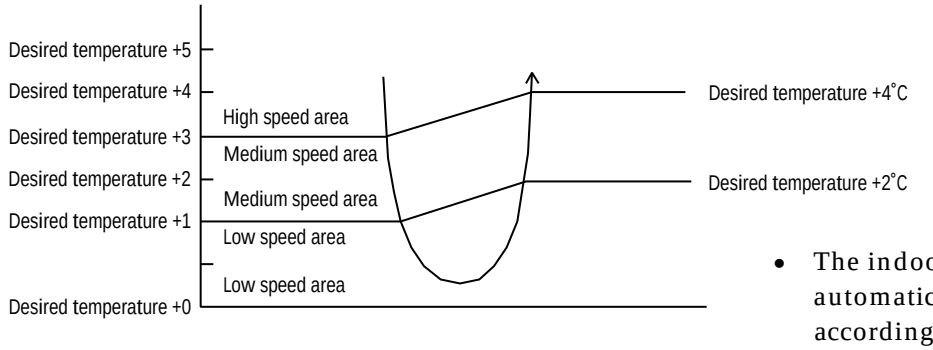


Operating condition

1. The turbo operation is available only in auto, cool, mild and heat mode.
2. The turbo operation is performed for 30 minutes when the turbo button is pressed. (including three minutes delay time)
3. Control of the indoor fan motor and compressor during turbo operation
   - Indoor fan motor = Heating High
     Cooling Turbo(fan speed one step higher than "high")
   - Compressor : continued on regardless of room temperature.
4. After an elapse of 30 minutes from the start of turbo operaiton, the turbo operation is ended, and the unit returns to the previous mode.
5. When you press the turbo key again during the turbo operation, the turbo operation mode is canceled, and the unit returns to the previous mode.

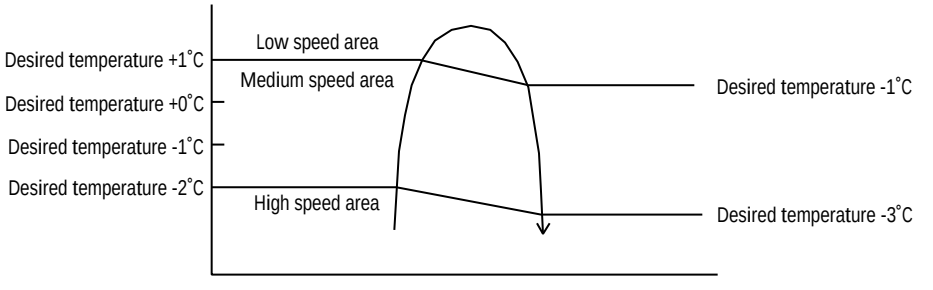
3-1-2(e) Fan Speed Auto

1. Cooling operation

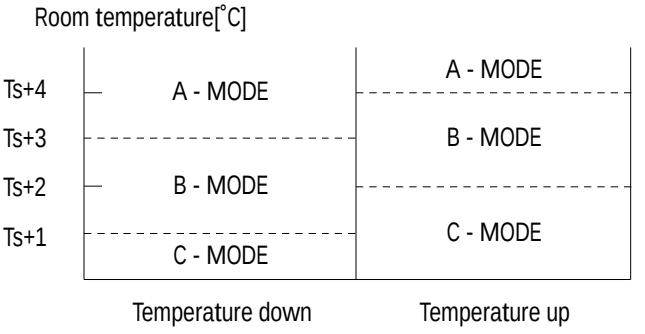


- The indoor fan motor speed is automatically controlled according to the difference between the indoor temperature and the desired temperature.

2. Heating operation



3-1-2(f) Dry Operation



Ts=desired temperature

1. On/off time by dry operation mode

Compressor	Operating mode		
	A - MODE	B - MODE	C - MODE
ON time	6 min.	5 min	3 min.
OFF time	4 min	5 min.	6 min.

- The indoor fan motor operation is fixed at a Low Speed

2. The dry operation mode is determined depending upon the difference between the indoor temperature (Ta) and desired temperature (Ts).

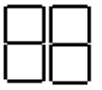
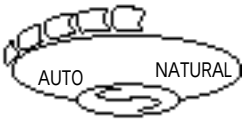
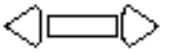
3. The unit is operated with the compressor on, and an indoor fan motor at a Low Speed for an initial six minutes (including a three-minute delay) after setting up the dry operation mode.

3-1-3 Key Types and Functions

3-1-3(a) Panel Key Types and Functions

KEY NAME	KEY OPERATING FUNCTION	KEY TYPE
ON/OFF	Start and end of operation - ON one time = operation start, ON again = operation end - No continued operation	TACT
Mode selection	Change of the operation mode -Each time the button is pressed (ON), the mode is changed in the following order ; "COOL → DRY → FAN → HEAT → AUTO → COOL" (standard = AUTO) -No continued operation	TACT
Fan speed selection	Setting of the indoor fan motor speed. -Eacn time the button is pressed (ON), the mode is changed in the following order; COOL:"LOW → MEDIUM → HIGH → NATURAL → AUTO → LOW" (standard = AUTO) HEAT:"LOW → MEDIUM → HIGH → AUTO → LOW" (standard = AUTO)	TACT
Temperature setting (up)	Increase the desired temperature display. -When turning the jog dial clock-wise, it displays the desired temperature and holding the jog dial continuously, the desired temperature is increased by the unit of 1˚C (COOL:18˚C → 30˚C, HEAT:16˚C → 30˚C) -One short, and continued operation.	JOG SHUTTLE DIAL
Temperature setting (down)	Decrease the desired temperature display. -When turning the jog dial counter clock-wise, it displays the desired temperature and holding the jog dial continuously, the desired temperature is decreased by the unit of 1˚C (COOL:30°C → 18°C, HEAT:30°C → 16°C) -One short, and continued operation.	JOG SHUTTLE DIAL

3-1-3(b) V.F. Display Operating Spec

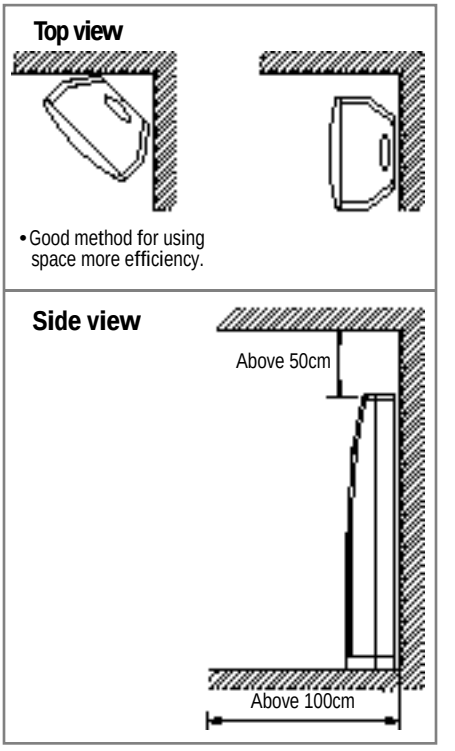
DISPLAY	OPERATING SPEC
OPERATING	• When the compressor is activated (outdoor power relay on) : ON • When the compressor is stopped (outdoor power relay off) :OFF
DEFROST	• During the defrost operation : ON • The defrost operation ended : OFF
HEAT COOL DRY AUTO FAN	• Display the selected "operation selection mode" AUTO, COOL, DRY, FAN, HEAT
TEMP. SET TEMP.  C	• When the ON/OFF is ON, the indoor temperature is displayed. • When changing the desired temperature, the indoor room temperature is displayed after displaying the desired for 5 senconds
CHECK	• The trouble is occured by self - diagnosis funtion :ON • The troubleshooting is completed : OFF
TIMER	• During reservation : ON • Reservation ended or canceled : OFF
 AUTO NATURAL	• Display the selected "fan speed selection mode" LOW, MEDIUM, HIGH, NATURAL, AUTO • Display operation of the indoor fan motor LOW, MEDIUM, HIGH, TURBO
TURBO	• During turbo operation : ON • Turbo operation ended or canceled : OFF
MILD	• During mild operation : ON • Mild operation ended or canceled : OFF
AIR SWING 	• When [the right and left turn] is on by the remote control, it displays
AIR SWING	• When [the up and down turn] is on by the remote control, it displays

3-2 Installationn

3-2-1 Selection of Installation Place

3-2-1(a) Indoor Unit

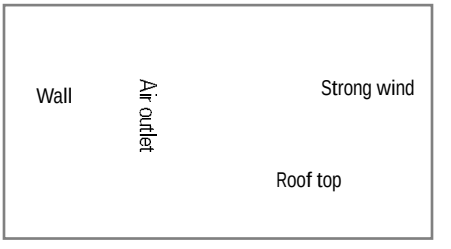
- Install the unit at a place close to the wall facing the outside as it is necessary to perform piping connection with the outdoor unit.
  - It is effective to install the unit at a window side to ensure uniform distribution of indoor temperature.
- Install the unit at a place where there is no obstacle against the wind around the air inlet and air outlet.
- Install the unit horizontally at a stable, rigid place.
  (When installing the unit at a place subjected to vibration, noise may occur.)
- Avoid a place near the door which is frequented by people.
- Avoid a place subject to direct sunlight.



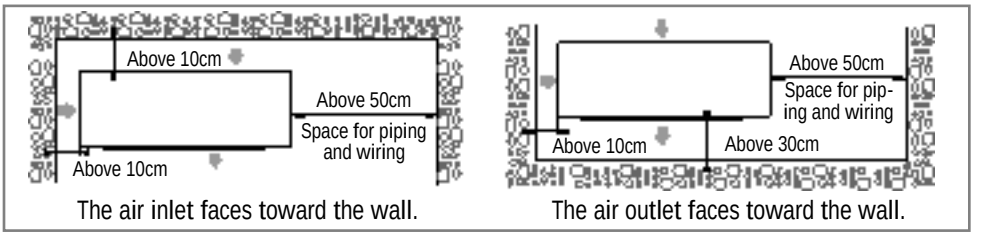
3-2-1(b) Outdoor Unit

- place free from the risk of combustible gas leakage.
- place which can bear the weight of the unit.
- place which can bear the fixing strength of the outdoor unit.
- Avoid a place subject to oil(including machine oil).
- Avoid a saline place
- Avoid a place subject to sulfide gas(hot spring zone).
  (When installing the unit at such special environmental conditions, it may cause machine trouble. When it is unavoidable to use such places. It requires special maintenance.)
- A place where the discharge air and noise of the outdoor unit do not disturb the neighborhood.
  (Take special care not to cause any inconvenience to your neighbors when installing the unit on the borderline with your neighborhood.)
- A place where strong wind does not head against the air outlet of the outdoor unit.
  (If a strong wind heads directly against the air outlet at the time of cool operation, a safety device can be operated.)
- Do not install the outdoor unit at an unstable place such as outer wall of an apartment or building.
  The outdoor unit may fall down, causing severe personal or property damage or loss.

- If there is any unavoidable reason to install the unit at such a place, take the following measures against the wind;
  1. When installing the unit at a roadside concentrated with buildings, install it parallel with the road.
  2. Install the unit so that the air outlet faces toward the wall at a place such as rooftop, which may be subjected to strong wind.



* Be sure to install the outdoor unit with consideration of service space.



3-2-2 Electrical Work

The electrical work should be performed by a specialist qualified for the work.

- Use the single phase power supply, and be sure to install the sub power distributing board for exclusive use with the unit(separately purchased by the user).
- Avoid octopus-type wiring as it can cause a drop in voltage, thus resulting in poor performance of the automatic control circuit.
- Be sure to install the earth leakage circuit breaker (separately purchased by the user).
- Be sure to connect the grounding wire.

Electric power spec

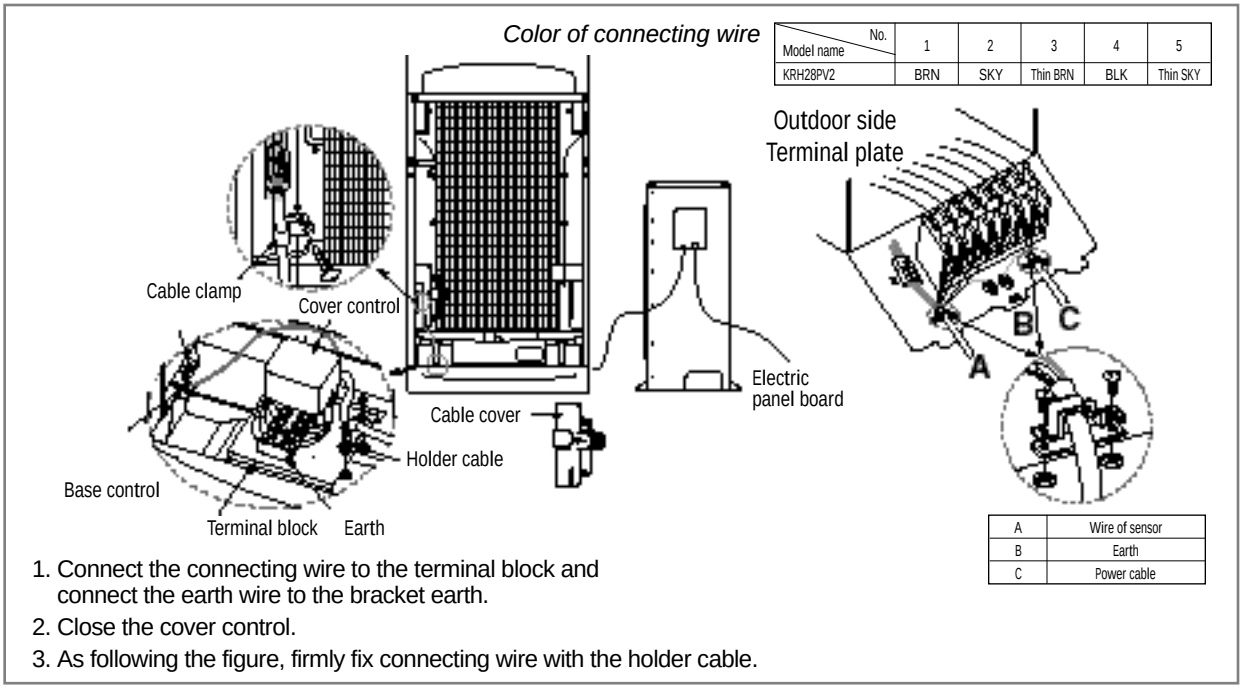
		SPEC
Power		Single phase 220V-240V~, 50Hz
Sub switch		30 A
Fuse		30 A
Electric wire	Below 20m	3.5 mm^2
Allowable voltage		198V ~ 264V

Connecting wire & PCB fuse spec

	TYPE	SPEC
Power cable	H07RN-F	3G 2.5mm^2 450-750V~
Connecting wire	H07RN-F	5G 1.0mm^2 450-750V~
	H05RN-F	2G 0.75mm^2 300-500V~
Sensor cable	H05RN-F	2G 0.75mm^2 300-500V~
PCB fuse	50T	250V~, 3.5A
	F2L	250V~, 2A

Indoor and Outdoor Connection Wiring

- When connecting the connecting wire between the indoor and outdoor unit, be sure to align the terminal block number with the connecting wire number.
- When the connecting wire is not properly connected, it may cause trouble.
  Be careful not to allow connecting wires and power lines to get in contact with service valve or the pipe without an insulator.



1. Connect the connecting wire to the terminal block and connect the earth wire to the bracket earth.
2. Close the cover control.
3. As following the figure, firmly fix connecting wire with the holder cable.

Electrical Wiring

1. Connect it to the terminal board N and L for power supply to the outdoor unit.
   In so doing, peel off the end of the power cord by about 5mm, and press the cord to the ring terminal for hooking.
2. Perform the power grounding using the screw for exclusive use with the outdoor unit.

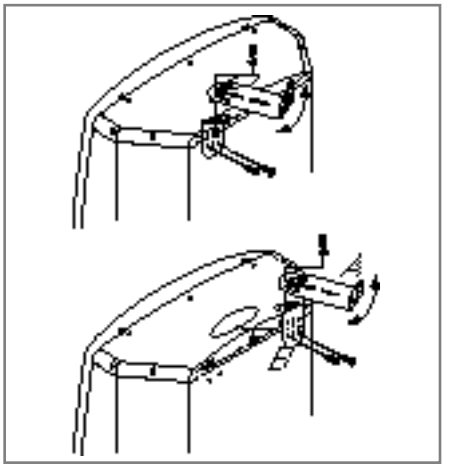
3-2-3 Installation Method

3-2-3(a) Indoor Unit

This unit is greater in height compared to its width, and thus it may fall down.
Therefore, be sure to fix the unit to the wall and floor surfaces securely to prevent the unit from falling down.

Fixing to the wall

- Fix the unit using the fixing holders separately supplied.
- Select a direction (right or left) according to a place of being installed.
- The fixing holder “B” was decided on a direction (front or rear) according to a condition of being installed.
  1. Fix the fixing holder “B” using the screw at a rear side groove.
  2. Put the fixing holder “A” on the fixing holder “B”, then fix holders using the nut, washer and bolt to direction you want.
  3. Fix the fixing holder “A” to the wall.



3-2-3(b) Outdoor Unit

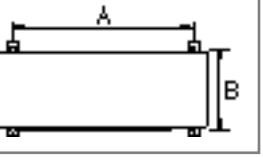
When using the anchor bolt

1. Fix the unit on a flat, rigid floor using the anchor bolt.
   (Anchor bolt : M10 x 4 points - separately purchased)

Anchor bolt fixing dimensions

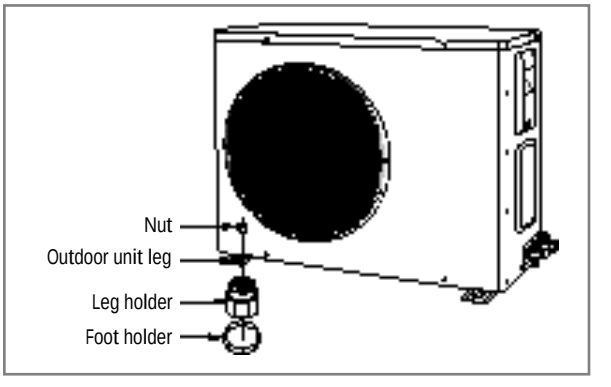
Unit:mm

A	B
660	335



When using the leg holder of the outdoor unit

1. Insert the foot holder (4EA, optional).
2. Remove the nut fastened to the leg holder, and then insert the leg holder into the hole of the outdoor unit leg.
3. Fix the unit securely with the nut.

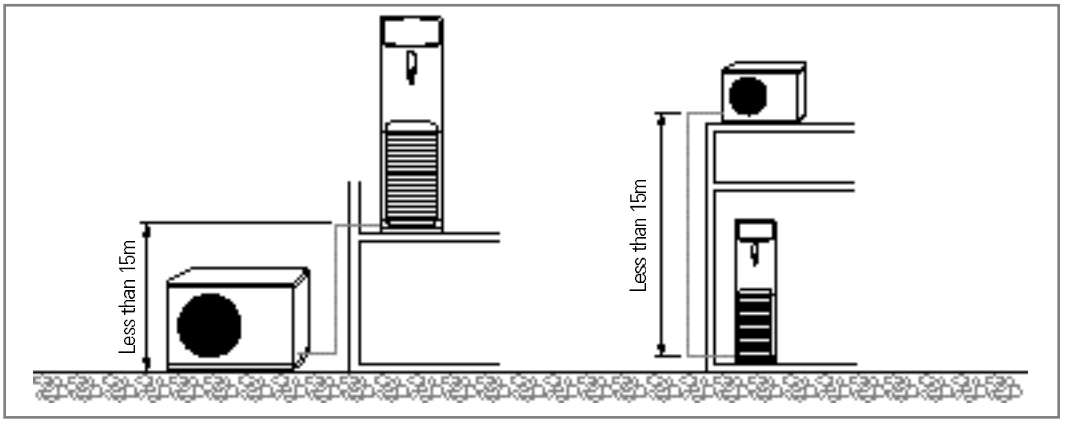


3-2-3(c) Installation Procedures

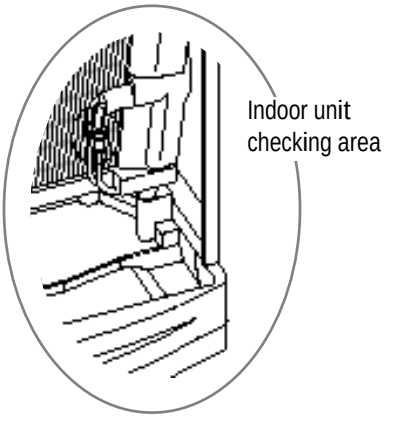
1 Open the inlet grille, and remove the flare nut.
2. Bend the connection pipe to an appropriate length using the spring bender depending upon the installation place.
   - Allowable pipe length : Maximum 25m
   - Allowable pipe drop distance : Maximum 15m
   - Make no more than ten bending points on the pipe
- When the pipe length is in excess of the standard pipe length of 5m, add the refrigerant (R-22) of 50g for each additional 1m.

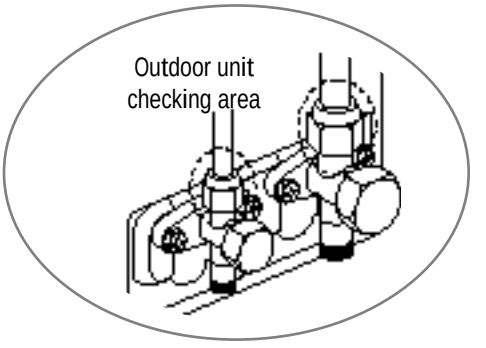
Caution

- If the pipe is lengthened, the performance of the unit is degraded, and the service life is shortened. Therefore, the pipe length should be as short as possible (less then 15m).



3. Install the high pressure pipe to the heat exchanger liquid pipe, and the low pressure pipe to the heat exchanger gas pipe respectively using the flare nut, taking care not to cause any leakage of refrigerant.
4. Be sure to insulate the pipe with appropriate insulation material.
5. Insert the drain hose into the drain pipe, and connect them by tying them to the cable tie to prevent any water leakage.
6. After completion of the installation, check the connecting area for any gas leakage.
7. Wind a finish tape when the wiring of the refrigerant pipe, the unit, and the drain piping are completed.

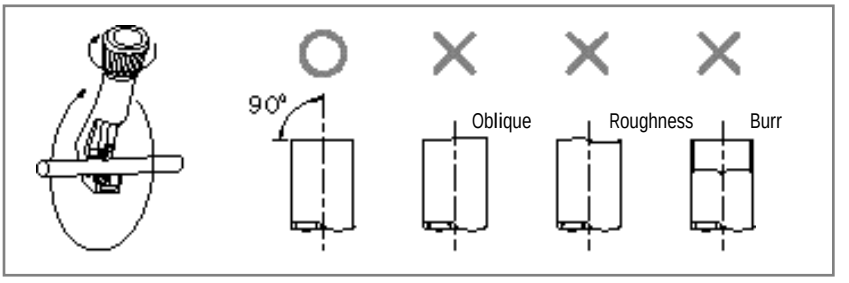




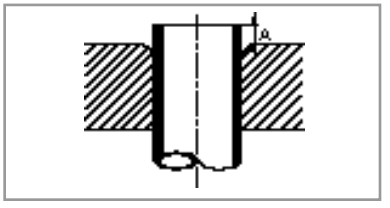
3-2-3(d) Connection of refrigerant pipe

Flare Processing

1. Cut the pipe using the pipe cutter.

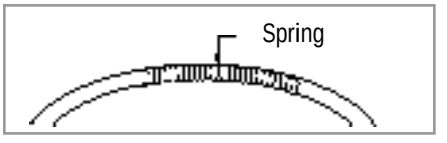


2. Insert the flare nut into the pipe, and then perform the flare processing.



Outer Diameter	A
ø 6.35 mm	1.3
ø 9.52 mm	1.8
ø 15.8 mm	2.0

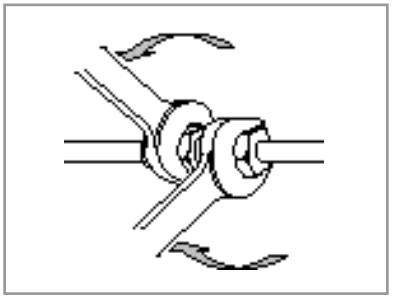
Pipe Bending



1. Perform bending of the pipe using the bender which has a specified bending radius.
2. Be sure to take full care to perform bending of the pipe successfully at one time. Bending and unbending the pipe more than twice makes the bending work increasingly difficult.
3. You may use the spring inserted into the gas pipe instead of the bender to bend the pipe.
4. When you bend the pipe using the spring, hold the pipe with both hands to prevent any distortion, and secure a minimum bending radius of more than 100mm.

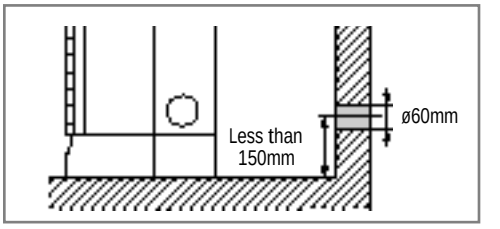
Tightening of Connection Parts

- Align the center of the connection piping, and tighten the flare nut by turning it with hand. Then tighten it again using the spanner in the direction as shown in the figure.



Outer Diameter	Tightening Torque	Final Torque	Remarks
ø 6.35mm	160 kg • cm	200kg • cm	
ø 9.52mm	400 kg • cm	450 kg • cm	
ø 15.8mm	700 kg • cm	750 kg • cm	

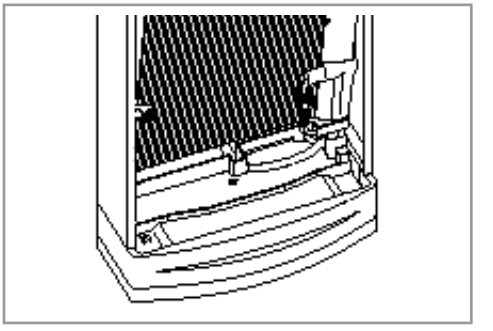
3-2-3(e) Drilling a Hole in the Wall



- Drill a hole of 60mm in diameter to the outside.
- The drilling should be done at a distance of less than 150mm from the floor facing the indoor unit.

3-2-3(f) Drain Hosel

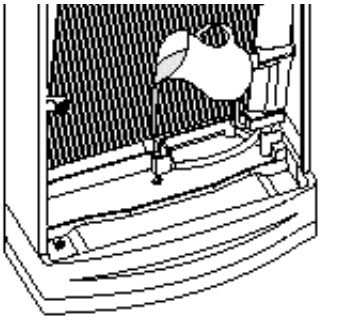
- Extend the drain hose to the drain hose connected to the drain pan, and fix it with the tape or a cable tie to prevent separation. Then make a covering of it so that water can not flow outwardly.



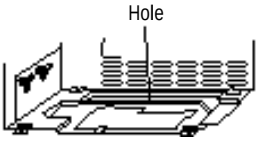
Piping Material	Vinyl Chloride(Inner diameter ø18mm, Outer diameter ø 23mm)
Insulator	Foamed Polyethylene

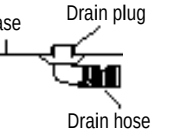
Caution

1. As the draining is of natural drain type, make the drain hose direct downward.
2. If there is any foreign substance in the drain plate, it may clog the drain pipe.
   Therefore, be sure to remove the foreign substance inside after installation.
3. After completion of installation, be sure to pour water into the drain pan, and then check the draining condition.
   (There is no problem in draining when the draining is completed within 20 seconds.)



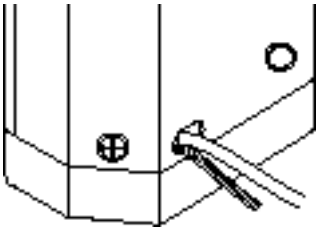
- In heating and deice operation, condensed water may be generated.
  Install drain line as gollowing procedure.
  1. Insert the drain plug into drain hole.
  2. And then connect drain hose to drain plug.





3-2-3(g)

- The piping of this unit can be connected to the right, left, and rear side. When you hit the area for piping connection slightly with a hammer, a hole is made.
- After connecting the piping and drain hose, insert the rubber cap as shown in the figure below.

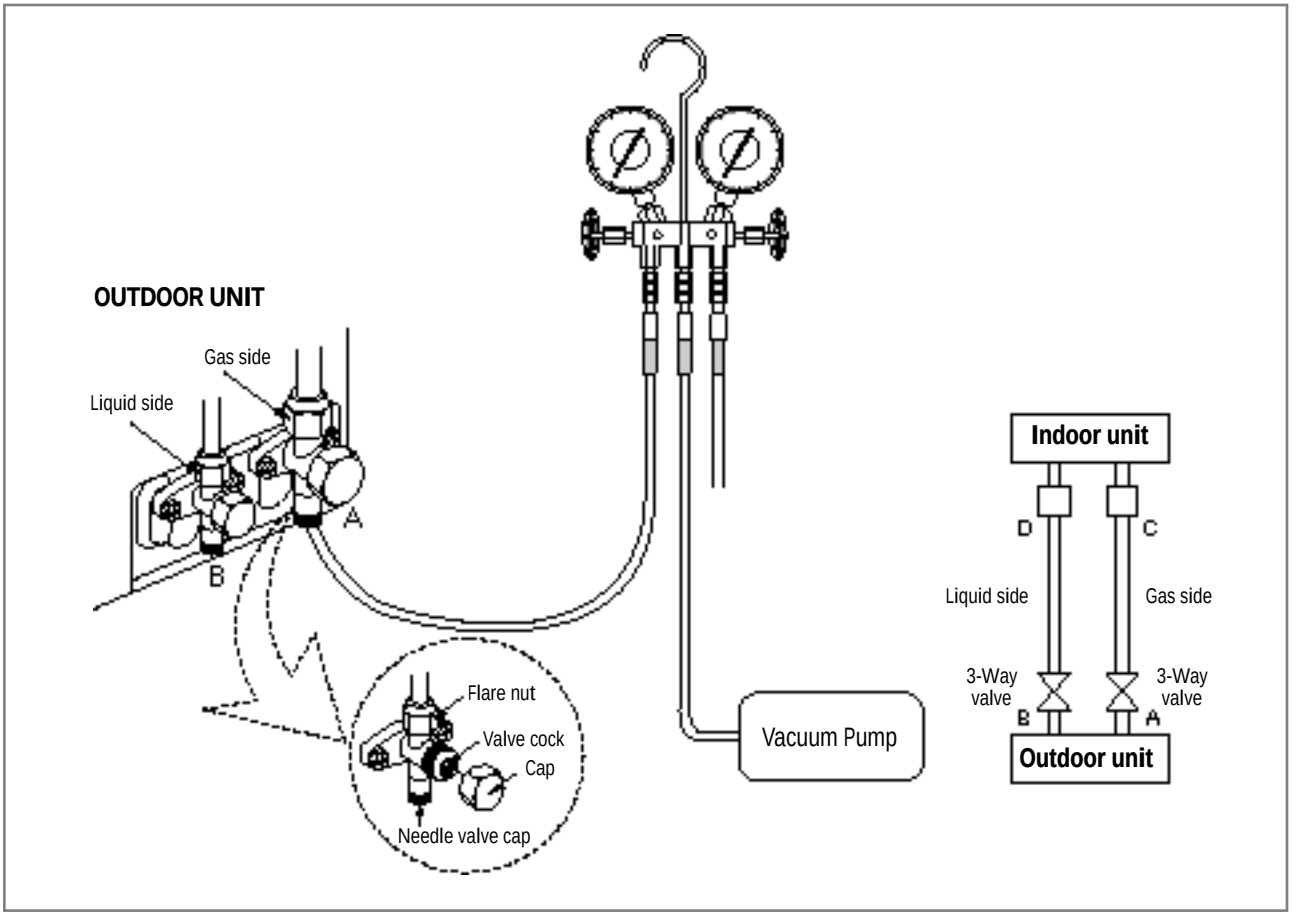


Holes for piping connection (3 points)

3-2-3(h) Air Purge

- The air in the indoor unit and in the pipe must be purged. If air remains in the refrigeration pipes, it will affect the compressor, reduce to cooling capacity and could lead to a malfunction.
  Use Vacuum Pump as shown at the figure.

1. Connect each assembly pipe to the appropriate valve on the outdoor unit and tighten the flare unt.
2. Connect the charging hose of low pressure side of manifold gauge to the packed valve having a service port as shown at the figure.
3. Open the valve of the low pressure side of manifold gauge counter-clockwise.
4. Purge the air from the system using vacuum pump for about 10 minutes.
   - Close the valve of the low pressure side of manifold gauge clockwise.
   - Make sure that pressure gauge show -0.1MPa(-76cmHg) after about 10 minutes.
     This procedure is very important in order to avoid gas leak.
   - Turn off the vacuum pump.
   - Remove the hose of the low pressure side of manifold gauge.
5. Set valve cock of both liquid side and gas side of packed valve to the open position.
6. Mount the valve stem nuts and the service port cap to the valve, and tighten them at the torque of 18N.m with a torque wrench.
7. Check for gas leakage.
   - At this time, especially check for gas leakage from the 3-way valve's stem nuts, and from the service port cap.



3-2-3(i) Refrigerant Refill

Air purge(at the time of new installation only)

↓

Close the gas pipe side valve by turning it clockwise.
Connect the pressure gauge to the low pressure side service valve, and then open the gas pipe side valve again.

↓

Connect it to the refrigerant filling tank.
(Turn the tank upside down : Fill the refrigerant in liquid form.)

↓

Start cooling operation.

↓

Check the pressure of the pressure gauge.
Check whether the low pressure side is within the range of 4.5~5.5kg/cm2G
(outside temperature 35°C).

↓

Open the tank and refill the refrigerant until arriving at the proper pressure.
(Refill the refrigent slowly checking the pressure.)

↓

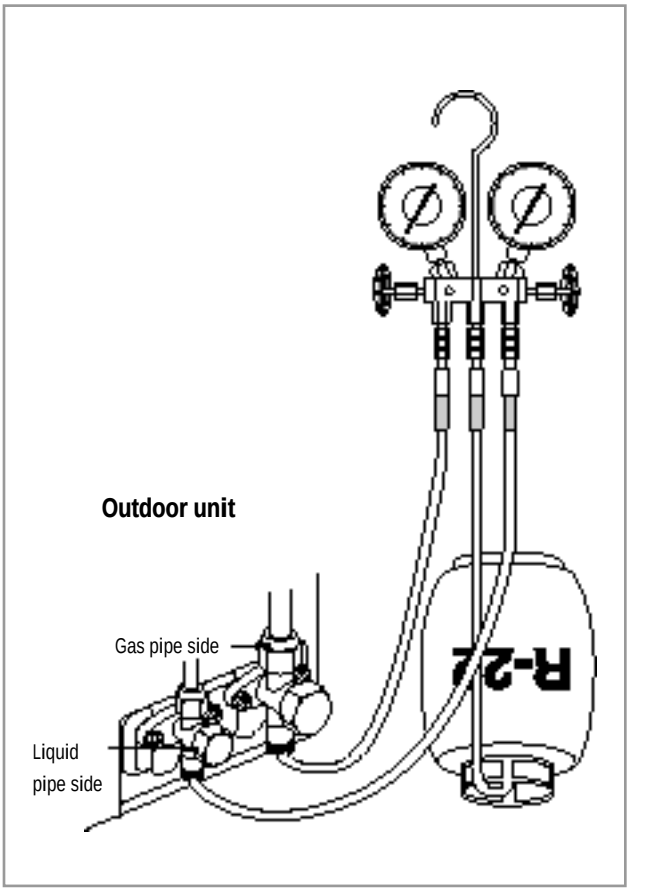
Stop operation.

↓

Close the gas pipe side valve, and loosen the pressure gauge connected.
Then open the gas pipe side valve again.

↓

Tighten the cap of each valve using a specified tool.

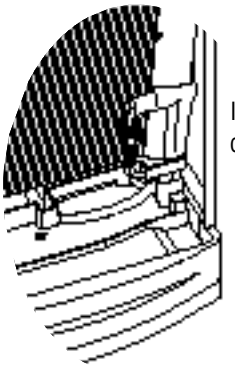


3-2-4 Check and Test Operation

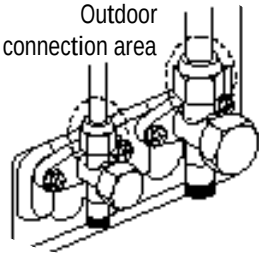
3-2-4(a) Check

- Be sure to check the following again after completion of installation.

1. Check the piping connection area for any gas leakage.

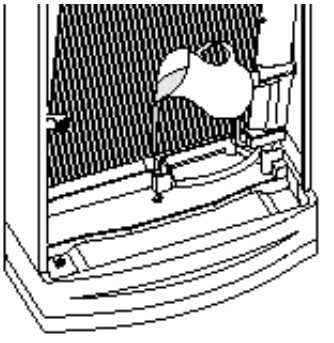


Indoor
connection area



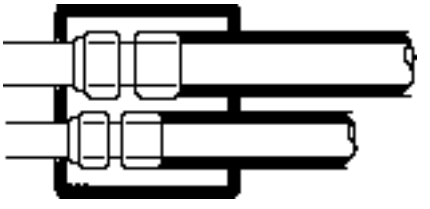
Outdoor
connection area

2. Is the drain hose properly connected?

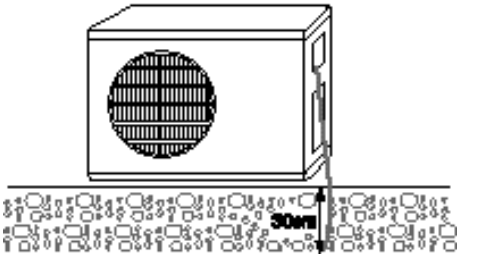


3. Is the insulation of the piping in good condition?

Insulation



4. Is grounding properly made?

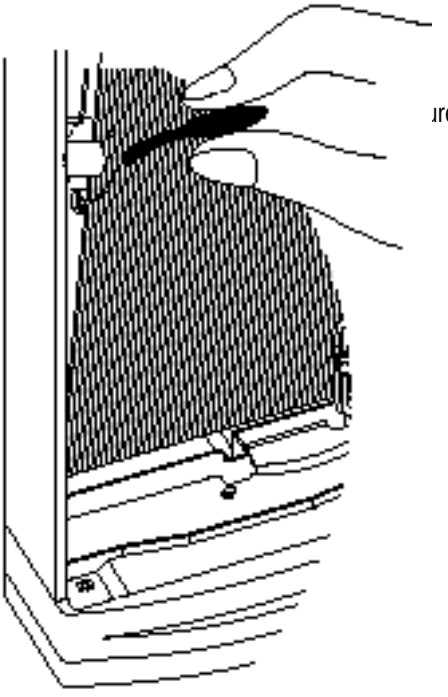


3-2-4(b) Test Operation

- After checking, read the owner's instructions carefully, and perform a test operation. Then deliver the unit to the customer.
  (When delivering the unit, be sure to read carefully and follow the contents of the owner's instructions.)

Caution

1. Be sure to check whether the service valve is opened before attempting to perform the test operation.
2. Never attempt to start test operation by force pressing the electronic contactor as it is very dangerous.
   (This is very dangerous as the protective device does not work.)
3. Be sure to perform the test operation after installment.
   It is easy to start the test operation in winter if you increase the sensor temperature to 23°C ~ 25°C by holding the indoor temperature sensor. (Cooling operation)

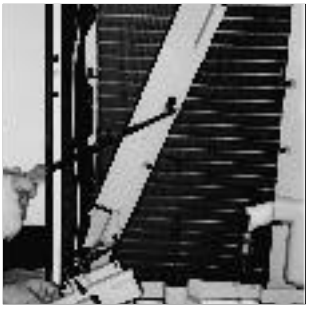


ıre Sensor

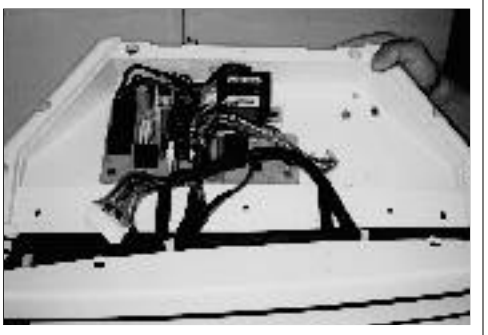
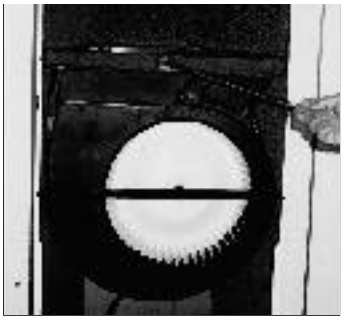
4. Disassembly and Reassembly

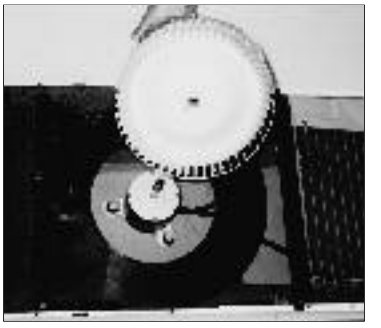
Stop operation of the air conditioner and remove the power before repairing the unit.

4-1 Indoor Unit

No	Parts	Procedure	Remark
①	Front Grille	1) Packaged air conditioner indoor unit.	
		2) Open the inlet grille, and remove the connector ring.	
		3) Loosen nine screws to remove the cover connect and cover evap'L.	
		4) Loosen one screws and pull the downward.	

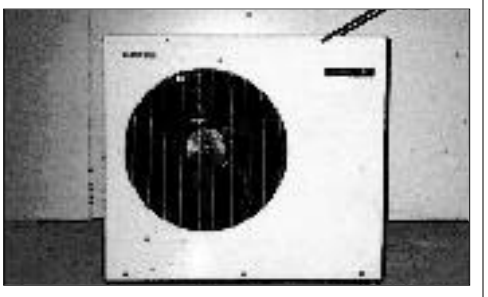
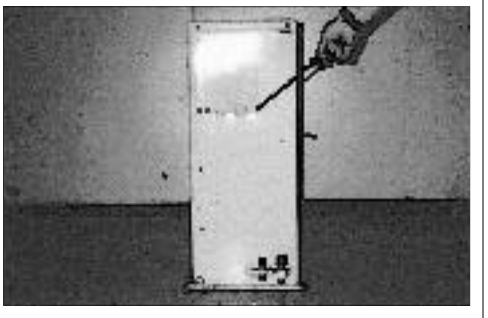
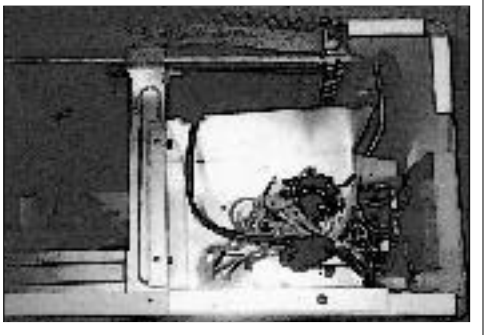
No	Parts	Procedure	Remark
		5) To remove the Deco Low, remove the right and left side two screws, and then seperate the wire connector.	
		6) Remove the four screws, and remove the cover top. Then seperate the connector wire	

No	Parts	Procedure	Remark
		7) Remove the six screws, and pull the upward cover top PCB.	
		8) Loosen the right and left side two screws, and then push the upward cover front.	
		9) Remove the five screws,and then remove the seven screws on the Duct up.	

No	Parts	Procedure	Remark
		10) Loosen one bolt to remove the blower.	
		11) Loosen the five locking screws, and remove the lower duct on the front side. Remove the left and right side two screws, and the upper side two screws. And then seperate the shutter body	

No	Parts	Procedure	Remark

4-2 Outdoor Unit

No	Parts	Procedure	Remark
		1) Loosen the seven screws on the cover top, and remove the cover top.	
		2) Loosen the two screws on the cover control, and remove the cover control.	
		3) Loosen the six screws in the side cabinet, and remove the side cabinet.	
		4) Connection of the control box wiring.	

MEMO

5. Troubleshooting

Troubleshooting procedures	
1st	• Items to be checked first.
2nd	• Check the corrective actions in the case of occurrence of self-diagnosis mode.
3rd	• When the trouble is not related to the 1st or 2nd items above, check the troubled area in detail in accordance with the fault analysis method by symptom.

5-1 Items to be checked first

1) Is the supply voltage appropriate ?
   Report to 3-10 Page-Electric
2) Is the connecting wire between the indoor unit and outdoor unit appropriate ?
   The indoor unit and outdoor unit should be connected with each other by 8 cables. (sensor wire included)
   Be sure to check whether the cables for the indoor unit and outdoor unit are securely connected by the same terminal number.
3) When any claim occurs according to the contents of the table below, it is not related to the trouble of the air conditioner at all.

No	Operation of air conditioner	Description
1	• In a COOL operation mode, the compressor does not operate at a room temperature higher than the setting temperature that the compressor should operate. • In a HEAT operation mode, the compressor does not operate at a room temperature lower than the setting temperature that the compressor and indoor fan should operate.	• In happens after a delay of 3 minutes when the compressor is reoperated. The same phenomenon occurs when a power is on. • As a phenomenon that the compressor is reoperated after a delay of 3 minutes, the indoor fan is adjusted automatically with reference to a temperature of the air blew
2	The fan speed cannot be controlled during AUTO, DRY, TURBO, or MILD operation.	• The fan speed is automatically set at the micom during AUTO, DRY, TURBO or MILD operation.
3	The temperature is not set during AUTO, FAN, TURBO or MILD operation.	• The desired temperature is automatically set at the micom during AUTO, TURBO or MILD operation. • The fan operation circulates the room air without temperature control
4	Compressor stops operation intermittently in DRY mode.	Compressor operation is controlled automatically in DRY mode depending on rthe room temperature.
5	Compressor of the outdoor unit is operating although it is turned off in a HEAT mode.	When the unit is turned off while de-ice is activated, the compressor continues operation for up to 9 minutes 40 sec (maximum) until the deice is completed.
6	Timer Display only of the indoor unit lights up and the air conditioner does not operate.	Timer is being activated and the unit is in ready mode. The unit operates normally if the timer operation is cancelled.
7	The compressor and indoor fan stop intermittently in HEAT mode.	The compressor and indoor fan stop intermittently if room tempreature exceeds a setting temperature in order to protect the compressor from overheated air in a HEAT mode.
8	Indoor fan and outdoor fan stop operation intermittently in a HEAT mode	The compressor operates in a reverse cycle to remove exterior ice in a HEAT mode, and indoor fan and outdoor fan do not operate intermittently for within 20% of the total heater operation

5-2 Self-diagnosis and Corrective Actions

NO	Control panel lamp condition	Temperature display	Cause	Corrective actions
1	Check display on blinking(1Hz)	E1	• Room temperature sensor short • Room temperature sensor open	• Replace the room temperature sensor. • Check the main PCB pattern and components for short or open.
2	Check display on blinking(1Hz)	E2	• Panel shutter binding at the time of mechanical assembly. • Defective panel shutter motor. • Defective sensor PCB.	• Remove cause of binding. • Replace the panel shutter motor. • Replace the sensor PCB.
3	Check display on blinking(1Hz)	E5	• Indoor evaporator sensor open or short	• Check the evaporator sensor wire • Replace the evaporator sensor wire • Check the main PCB pattern and componets for short or open
4	Check display on blinking(1Hz)	E6	• Outdoor condensor sensor open or short	• Check the condensor sensor wire • Replace the evaporator sensor wire • Check the main PCB pattern and componets for short or open

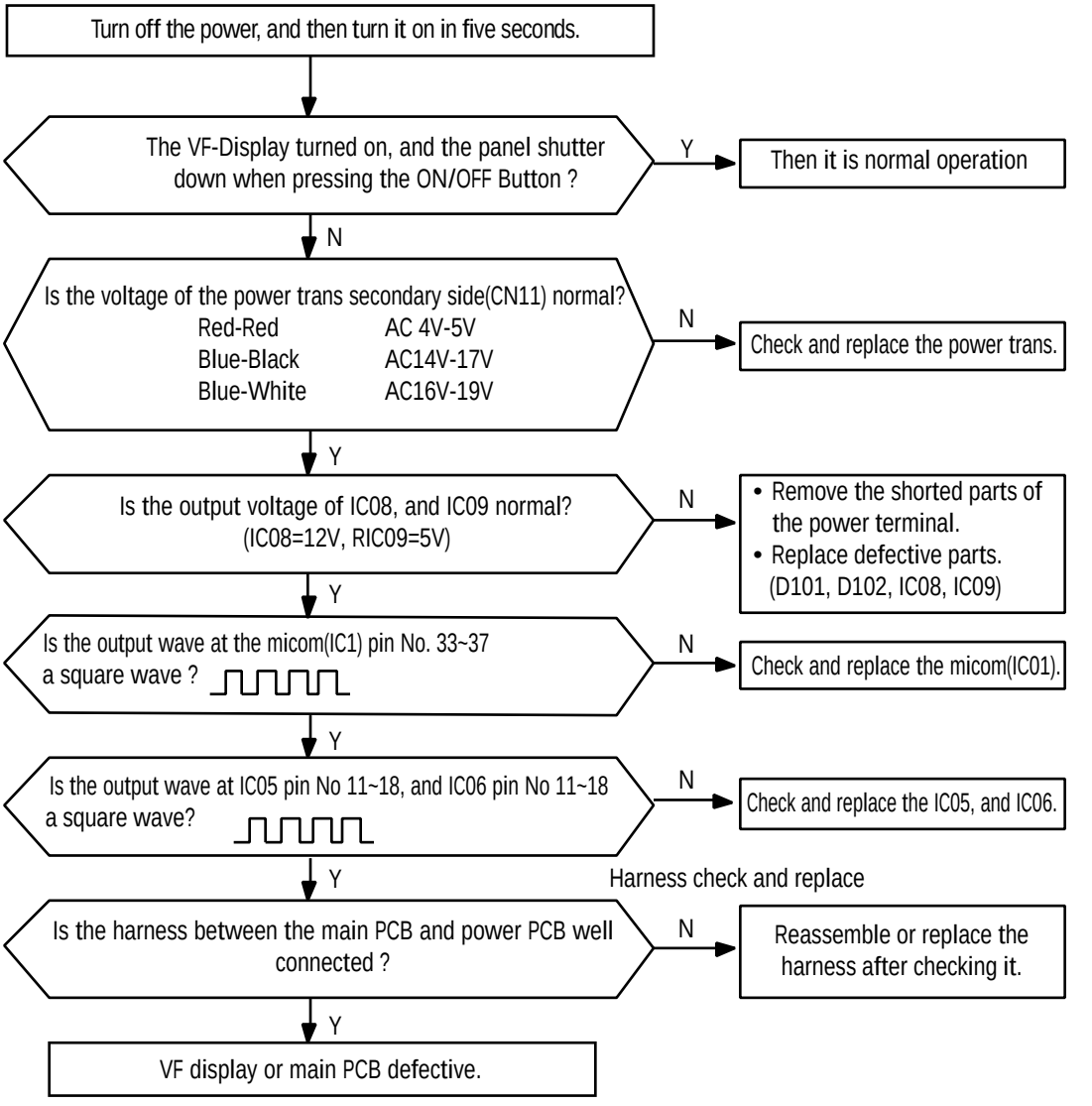
5-3 Fault Analysis by Symptom

5-3-1 No Power (No display)

1) Checkpoints

① Is the voltage of the power source normal ?
② Is the power line in good contact ?
③ Check the power fuse (F701, F702) and PCB fuse (F101) for open.
④ Are the primary and secondary sides of the power-trans in good contact with the connector?
⑤ Is the output voltage of IC08 (KA7812)normal ? (DC 11.5V~DC 12.5V)
⑥ Is the output voltage of IC09 (KA7805)normal ? (DC 4.5V~DC 5.5V)

2) Checking Procedures <After checking the checkpoints of clause 1)>

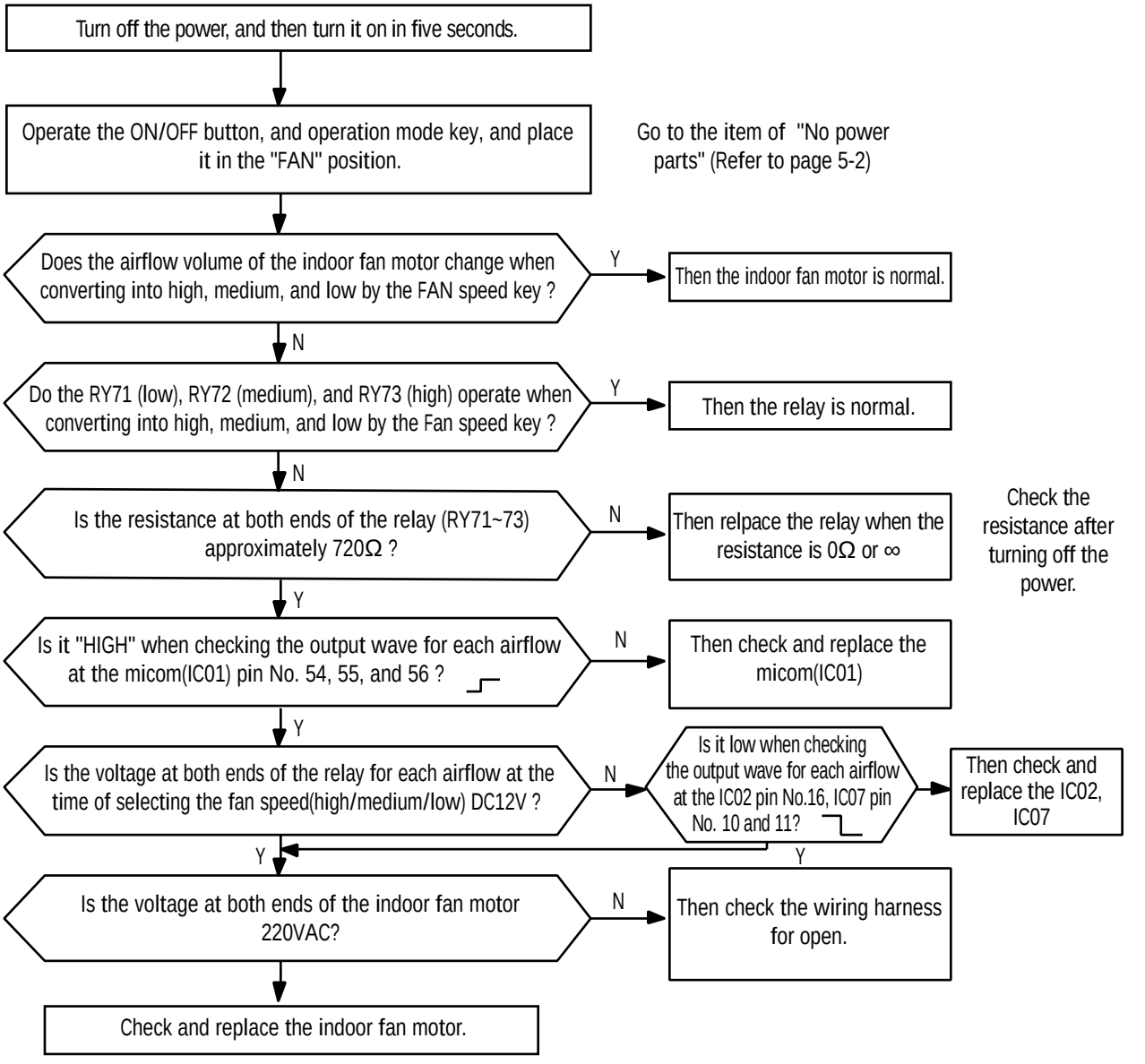

Turn off the power, and then turn it on in five seconds.
The VF-Display turned on, and the panel shutter down when pressing the ON/OFF Button ?
Y
Then it is normal operation
N
Is the voltage of the power trans secondary side(CN11) normal?
Red-Red AC 4V-5V
Blue-Black AC14V-17V
Blue-White AC16V-19V
N
Check and replace the power trans.
Y
Is the output voltage of IC08, and IC09 normal?
(IC08=12V, RIC09=5V)
N
• Remove the shorted parts of the power terminal.
• Replace defective parts.
(D101, D102, IC08, IC09)
Y
Is the output wave at the micom(IC1) pin No. 33~37 a square wave ?
N
Check and replace the micom(IC01).
Y
Is the output wave at IC05 pin No 11~18, and IC06 pin No 11~18 a square wave?
N
Check and replace the IC05, and IC06.
Y
Harness check and replace
Is the harness between the main PCB and power PCB well connected ?
N
Reassemble or replace the harness after checking it.
Y
VF display or main PCB defective.

5-3-2 When the Indoor Fan Motor does not Operate.

1) Checkpoints

① Is the voltage of the power source normal?
② Is the indoor fan connector (CN71) in good contact?
③ Is the starting condenser of the fan motor in good contact with the terminal?
④ Is the resistance at both ends of the relay (RY71 ~ RY74) coil approximately 720Ω?

2) Checking Procedures <After checking the checkpoints of clause 1)>

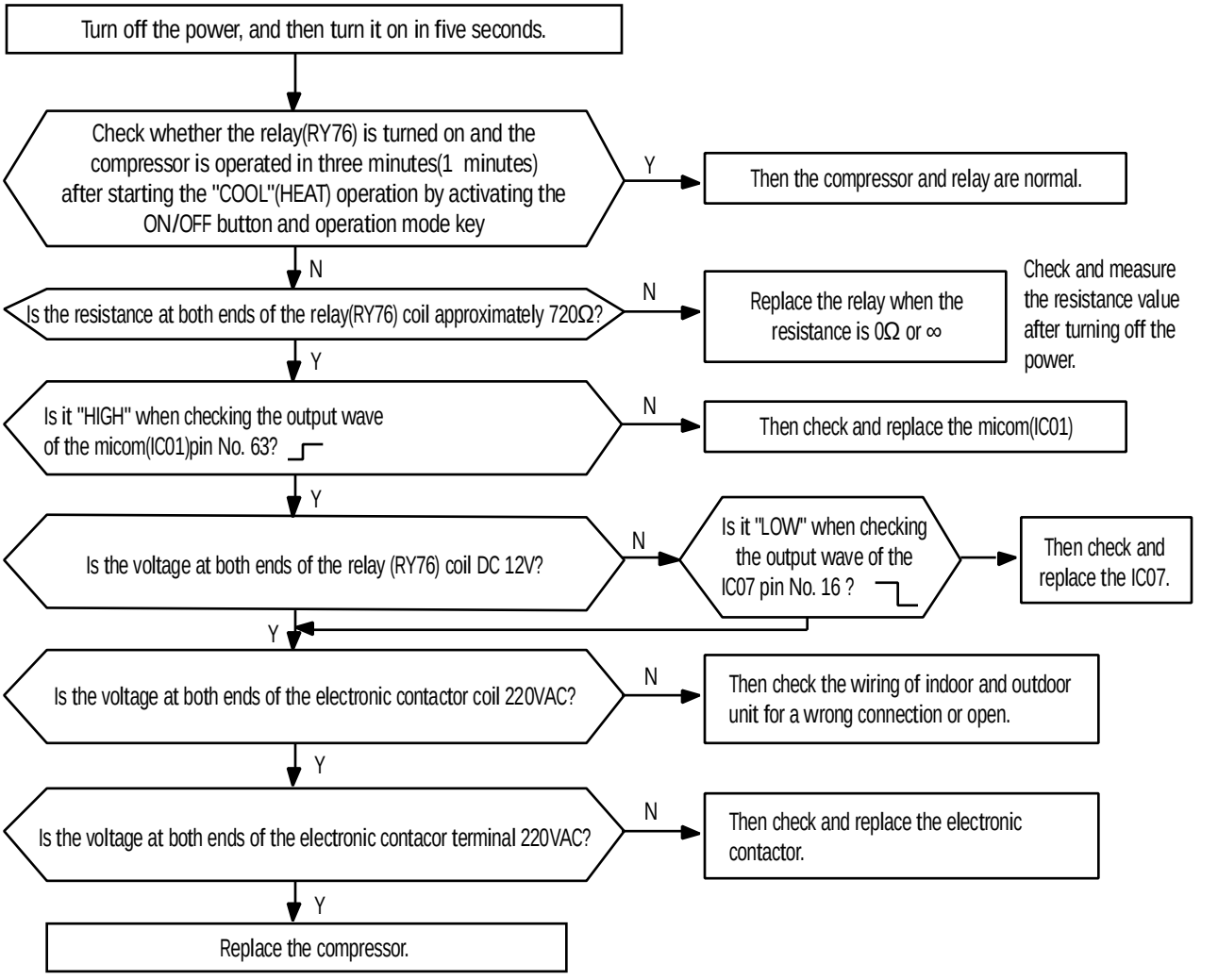

Turn off the power, and then turn it on in five seconds.
Operate the ON/OFF button, and operation mode key, and place it in the "FAN" position.
Go to the item of "No power parts" (Refer to page 5-2)
Does the airflow volume of the indoor fan motor change when converting into high, medium, and low by the FAN speed key ?
Y
Then the indoor fan motor is normal.
N
Do the RY71 (low), RY72 (medium), and RY73 (high) operate when converting into high, medium, and low by the Fan speed key ?
Y
Then the relay is normal.
N
Is the resistance at both ends of the relay (RY71~73) approximately 720Ω ?
N
Then relpace the relay when the resistance is 0Ω or ∞
Check the resistance after turning off the power.
Y
Is it "HIGH" when checking the output wave for each airflow at the micom(IC01) pin No. 54, 55, and 56 ?
N
Then check and replace the micom(IC01)
Y
Is the voltage at both ends of the relay for each airflow at the time of selecting the fan speed(high/medium/low) DC12V ?
N
Is it low when checking the output wave for each airflow at the IC02 pin No.16, IC07 pin No. 10 and 11?
Then check and replace the IC02, IC07
Y
Y
Is the voltage at both ends of the indoor fan motor 220VAC?
N
Then check the wiring harness for open.
Check and replace the indoor fan motor.

5-3-3 When the Compressor Does not Operate

1) Checkpoints

① Is the voltage of power source normal?
② Is the desired temperature set at a higher level than the current temperature at the time of "COOL" operation?
③ Is the desired temperature set a lower(or equal) level than the current temperature at the time of "HEAT" operation?
④ Is the power-in in good contact with the comp. connector(CN71)?
⑤ Check the wirings of the outdoor and indoor unit for a wrong connection or poor contact.
⑥ Isn't the compressor in a delay operation standy-by state?(40sec~3minutes)

2) Checking Procedures <After checking the checkpoints of clause 1)>


Turn off the power, and then turn it on in five seconds.
Check whether the relay(RY76) is turned on and the compressor is operated in three minutes(1 minutes) after starting the "COOL"(HEAT) operation by activating the ON/OFF button and operation mode key
Y
Then the compressor and relay are normal.
N
Is the resistance at both ends of the relay(RY76) coil approximately 720Ω?
N
Replace the relay when the resistance is 0Ω or ∞
Check and measure the resistance value after turning off the power.
Y
Is it "HIGH" when checking the output wave of the micom(IC01)pin No. 63?
N
Then check and replace the micom(IC01)
Y
Is the voltage at both ends of the relay (RY76) coil DC 12V?
N
Is it "LOW" when checking the output wave of the IC07 pin No. 16 ?
Then check and replace the IC07.
Y
Is the voltage at both ends of the electronic contactor coil 220VAC?
N
Then check the wiring of indoor and outdoor unit for a wrong connection or open.
Y
Is the voltage at both ends of the electronic contacor terminal 220VAC?
N
Then check and replace the electronic contactor.
Y
Replace the compressor.

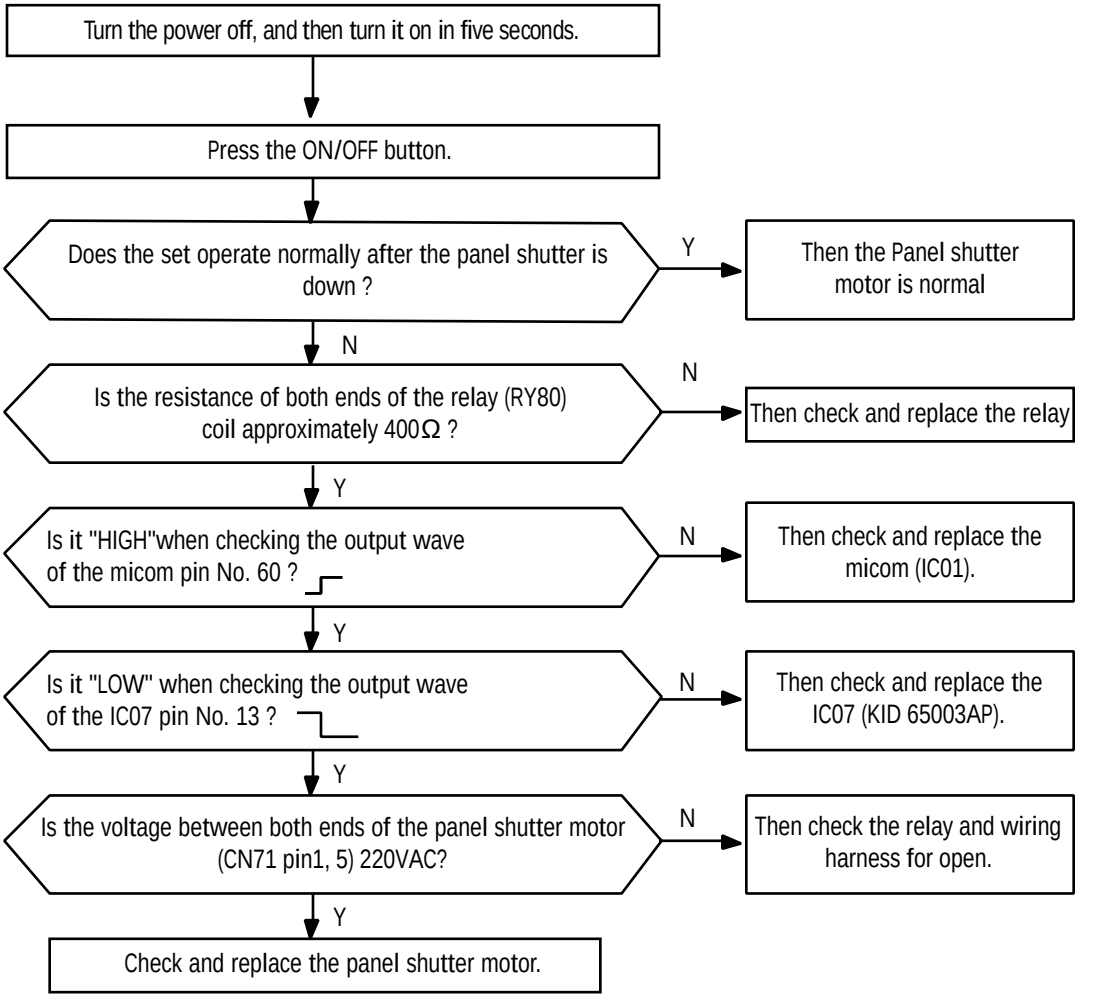
5-3-4 When the Panel Shutter does not Operate("E2" Error Mode)

1) Checkpoints

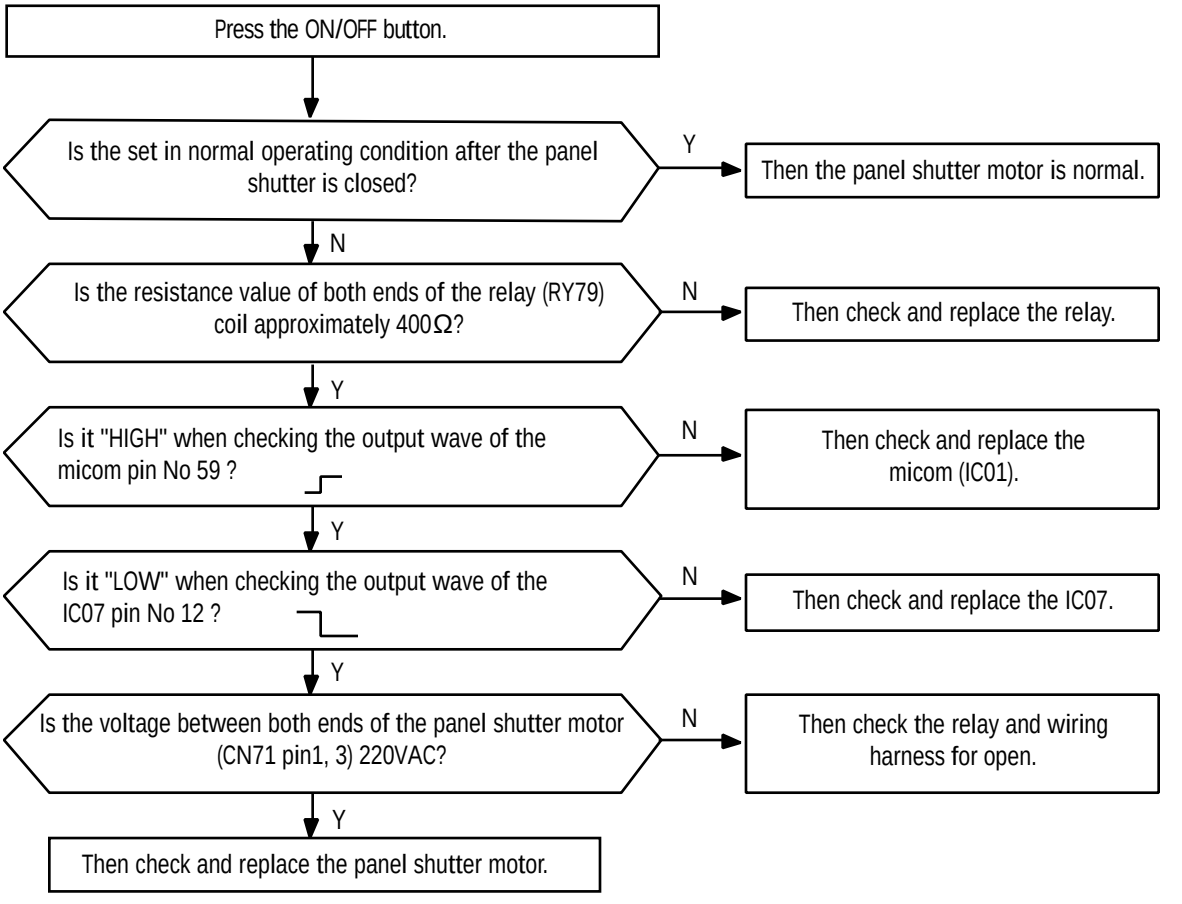
① Is the voltage of the power source normal?
② Is the door-motor connector (CN72) in good contact?
③ Is the shutter sensor PCB in good contact with the main PCB connector (CN61)?
④ Is the resistance value of both ends of the relay RY79, RY80 approximately 400Ω?

2) Checking Procedures

① At the time of operation(Panel shutter open)


Turn the power off, and then turn it on in five seconds.
Press the ON/OFF button.
Does the set operate normally after the panel shutter is down ?
Y
Then the Panel shutter motor is normal
N
Is the resistance of both ends of the relay (RY80) coil approximately 400Ω ?
N
Then check and replace the relay
Y
Is it "HIGH"when checking the output wave of the micom pin No. 60 ?
N
Then check and replace the micom (IC01).
Y
Is it "LOW" when checking the output wave of the IC07 pin No. 13 ?
N
Then check and replace the IC07 (KID 65003AP).
Y
Is the voltage between both ends of the panel shutter motor (CN71 pin1, 5) 220VAC?
N
Then check the relay and wiring harness for open.
Y
Check and replace the panel shutter motor.

② Operation Stop (panel shutter closed)


Press the ON/OFF button.
Is the set in normal operating condition after the panel shutter is closed?
Y
Then the panel shutter motor is normal.
N
Is the resistance value of both ends of the relay (RY79) coil approximately 400Ω?
N
Then check and replace the relay.
Y
Is it "HIGH" when checking the output wave of the micom pin No 59 ?
N
Then check and replace the micom (IC01).
Y
Is it "LOW" when checking the output wave of the IC07 pin No 12 ?
N
Then check and replace the IC07.
Y
Is the voltage between both ends of the panel shutter motor (CN71 pin1, 3) 220VAC?
N
Then check the relay and wiring harness for open.
Y
Then check and replace the panel shutter motor.

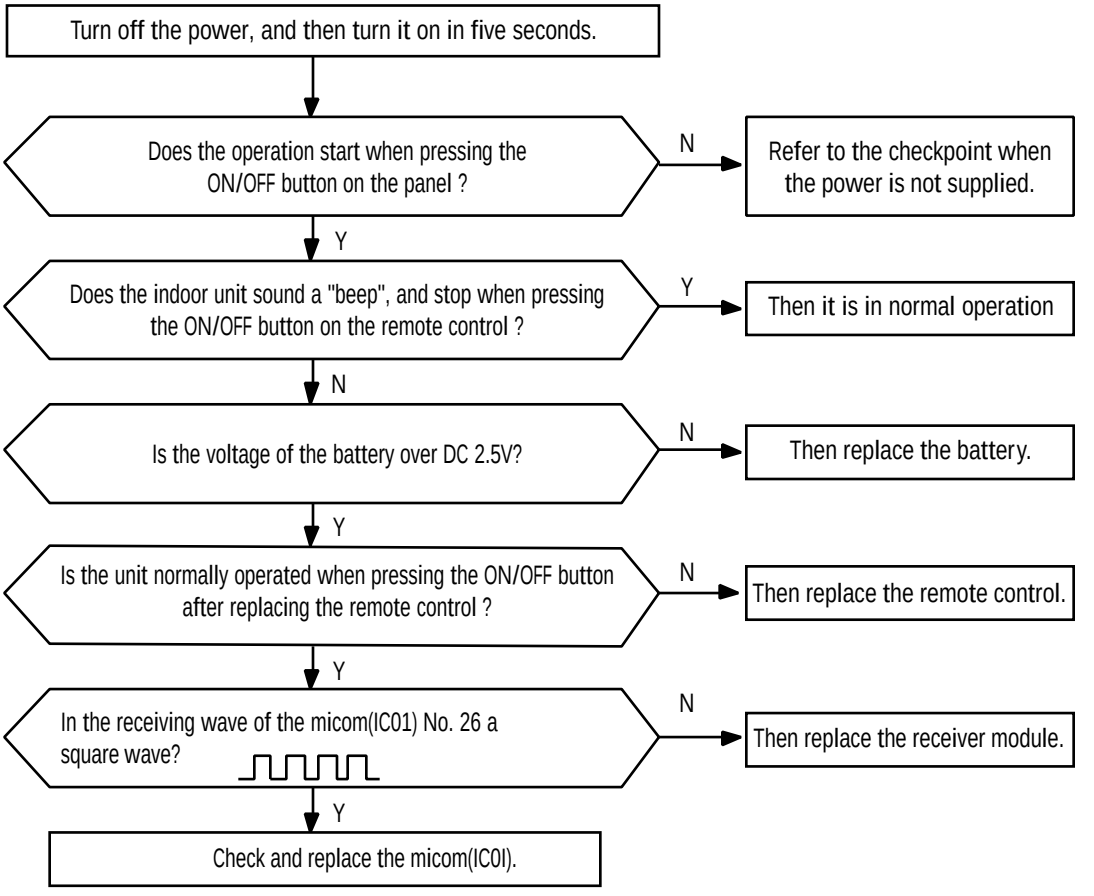
- The panel shutter motor is operated by the ON / OFF Button only. When the on / off signal is on, the panel shutter opening / closing is detected by the photo sensor installed on the shutter PCB.
- If the panel shutter opening / closing is not sensed within 30 seconds after pressing the ON / OFF button, the "E2" error mode occurs.
- When the "E2" error mode occurs under the condition of good structural assembly and panel shutter motor operating , check the following, and replace the shutter PCB.
  1) Is the wiring harness between the shutter PCB and main PCB in good contact ?
  2) Is the power (DC5V) applied to the shutter PCB only when the shutter motor is operated ?
  3) Is the out put voltage normal when opening / closing the Panel shutter ?

Micom / Classification	22 PIN	23 PIN
Panel shutter closing sensed	0V	5V
Panel shutter opening sensed.	5V	0V

5-3-5 When the remote control does not operate

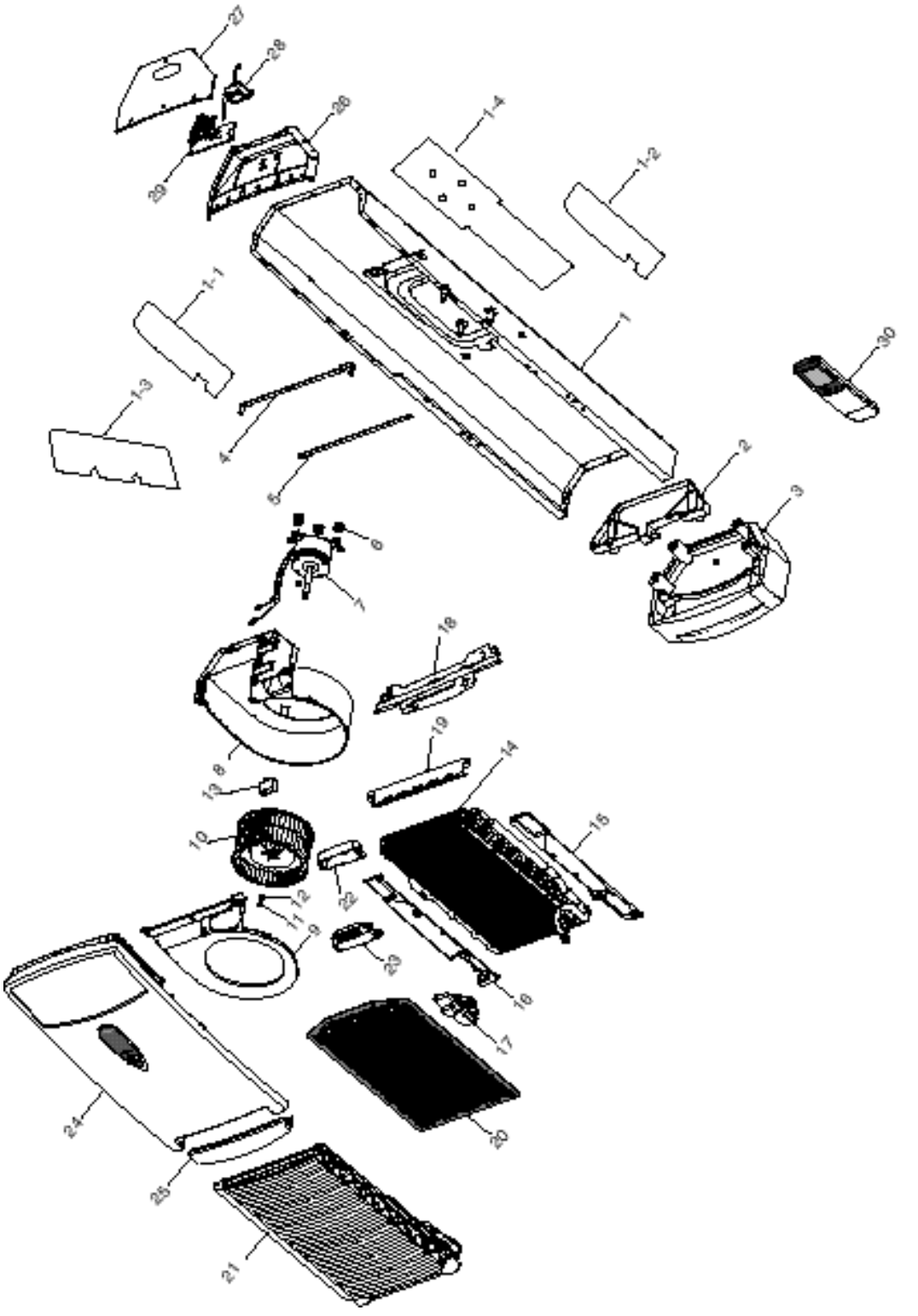
1) Checkpoint
The set sounds "beep" when it receives the signal of the remote control.

2) Checking Procedures


Turn off the power, and then turn it on in five seconds.
Does the operation start when pressing the ON/OFF button on the panel ?
N
Refer to the checkpoint when the power is not supplied.
Y
Does the indoor unit sound a "beep", and stop when pressing the ON/OFF button on the remote control ?
Y
Then it is in normal operation
N
Is the voltage of the battery over DC 2.5V?
N
Then replace the battery.
Y
Is the unit normally operated when pressing the ON/OFF button after replacing the remote control ?
N
Then replace the remote control.
Y
In the receiving wave of the micom(IC01) No. 26 a square wave?
N
Then replace the receiver module.
Y
Check and replace the micom(IC0I).

6. Exploded Views and Parts List

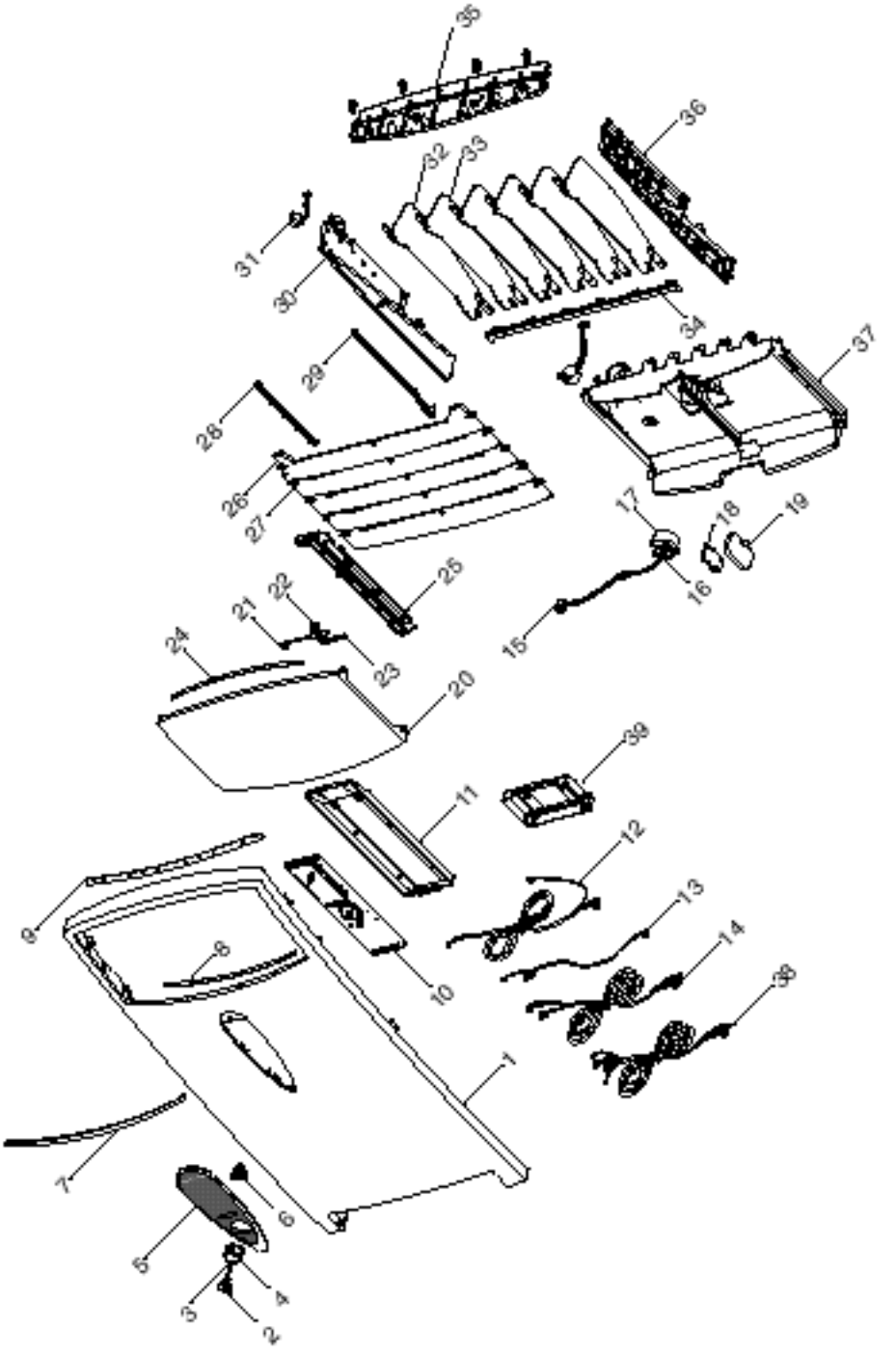
6-1 Indoor Unit



■ Parts List

No.	CODE NO	Description	Specification	Q'TY	Remark
1	DB90-00044A	ASS'Y-CABI IN	APH180YD, SC-97470T	1	
1-1	DB72-60018A	INSULATION-SIDE LF	T13, W284, L1563, FOAM-P	1	
1-2	DB72-60005A	INSULATION-SIDE RH	T13, W284, L1563, FOAM-P	1	
1-3	DB72-60009A	INSULATION-BACK UP	T13, W318, L390, FOAM-PU	1	
1-4	DB72-60008A	INSULATION-BACK	T7, W318, L1174, FOAM-PE	1	
2	DB92-70065A	ASS'Y-PANEL DRAIN	DRAIN;AP-2037, -	1	
3	DB90-00072A	ASS'Y-BASE DECO	ABS, T2.0, SC-96481R, -	1	
4	DB61-30479B	SUPPORTER-DUCT	SGCC-M, Z, T1.0, -, -, -	1	
5	DB61-30472A	SUPPORTER-CABINET	SECC-P(20/20), T1.2, BLK	1	
6	DB73-10021C	GROMMET-MOTOR IN	NBR, 32X23.2, BLACK, 45	3	
7	DB31-10159C	MOTOR-FAN IN	APH180YD, INDUCTION, 220V, 0.7	1	
8	DB67-40022B	DUCT-LOW	ABS, BLK, AP-1537, -	1	
9	DB67-40021B	DUCT-UP	ABS, BLK, AP-1537, -	1	
10	DB67-50050D	BLOWER	ABS, OD324, -	1	
11	DB60-30027A	NUT-BLOWER	HEX, 2C, M12, ZPC3, SCP1, -	1	
12	DB60-50029A	WASHER-BLOWER	PLAIN, ID12.7, -. T3.0, ZPC3, S	1	
13	2501-001043	C-OIL	4.5UF, 450VAC, BK, 38X37, 27	1	
14	DB96-00104A	ASS'Y-EVAP	APH180YD, WAVE	1	
15	DB63-10391A	COVER-EVAP RH	ABS, T2.0, SC-96481R, -, -	1	
16	DB63-10392A	COVER-EVAP LF	ABS, T2.0, SC-96481R, -, -	1	
17	DB63-10398A	COVER-CONECTOR	ABS, T2.5, GRY, -, -	1	
18	DB90-00068A	ASS'Y-BKT EVAP	EVAP	1	
19	DB63-10437A	COVER EVAP' UP	SECC-P, BLK	1	
20	DB74-10085B	FILTER-PRE	FILTER, T0.3, W404XL715	1	
21	DB92-10308B	ASS'Y-GRILLE INLET	Y1(E-SERISE), PEARL. COA	1	
22	DB90-41019B	ASS'Y-CASE JOINT	Y1-PROJECT, -	1	
23	DB63-10438A	COVER-JOINT	ABS, T2.5, BLK, -, -	1	
24	DB90-40150C	ASS'Y-COVER FRONT	APH180YD, AUTO	1	
25	DB90-40140C	ASS'Y-COVER LOW	KFH28PV2, LOGO	1	
26	DB90-40101C	ASS'Y-COVER TOP PCB		1	
27	DB90-40100C	ASS'Y-COVER TOP		1	
28	DB26-10079A	TRANS-POWER	13.6, 230, 50, -, -, 16.7, 1.2, -, -	1	
29	DB93-10532B	ASS'Y-PCB SUB	KFH28PV2, PCB-SUB	1	
30	DB93-30070D	ASS'Y-REMOCON	KFH28PV2	1	

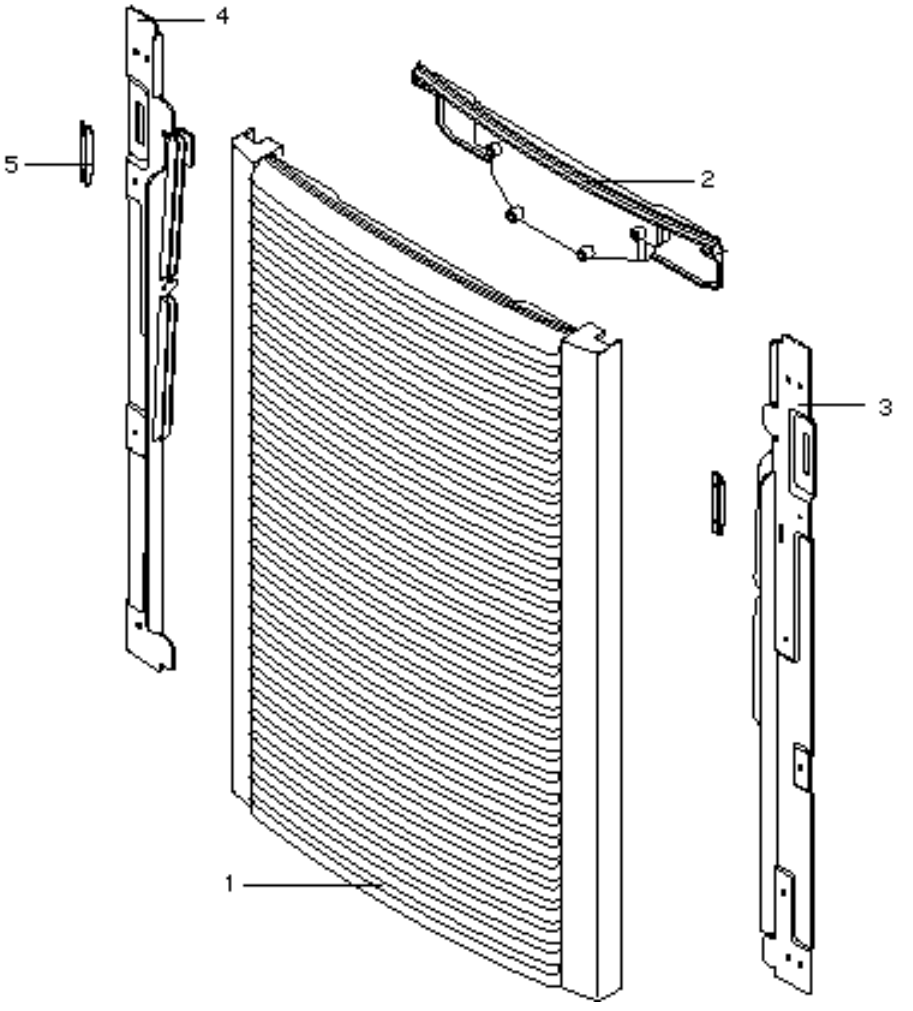
6-1-1 ASS'Y COVER FRONT



■ Parts List

No.	CODE NO	Description	Specification	Q'TY
				KFH28PV2
•	DB90-40150C	ASS'Y COVER FRONT	ASS'Y KFH28PV2	1
1	DB63-10390C	COVER FRONT	ABS, PEARL COATING	1
2	DB64-50121C	KNOB MAIN	ABS, GRAY	1
3	DB67-60027B	SPRING KNOB	COIL, SPS6	1
4	DB64-50120B	KNOB SHUTTLE	ABS, GRAY	1
5	DB64-70066D	PANEL-CONTROL	ABS, SMOK, INMOLD	-
6	DB64-50110A	KNOB SELECT	SILICON, GRAY	1
7	DB64-50111A	DECO FRONT	ABS, PNC2	-
8	DB61-30482B	SUPORT FRONT	SGCC-M T1.2	1
9	DB61-30481A	SUPORT TOP	SGCC-M T1.2	1
10	DB93-10531B	ASS'Y PCB MAIN	KFH28PV2	1
11	DB61-40213A	HOLDER PCB	ABS	1
12	DB39-20260A	CONNECT WIRE CONTROL	PHDR-24VS	1
13	DB39-20470A	CONNECT WIRE	AWG24/10	1
14	DB39-20365A	CONNECT WIRE POWER	AWG20/13	1
15	DB39-20258B	CONNECT WIRE SHUTTER	YH-396-05AV	1
16	DB66-70002A	GEAR SHUTTER	PA	1
17	DB31-10124A	MOTOR GEARD	MSEDC10P01	1
18	DB93-10409A	ASS'Y PCB SENSOR	32 X 60	1
19	DB61-40210A	HOLDER SENSOR	ABS	1
20	DB64-70065B	PANEL SHUTTER	ABS, PEAL COATING	1
21	DB61-70052A	HINGE SHUTTER	NYLON 66	1
22	DB6660020A	LINK SHUTTER	NYLON 66	1
23	DB61-70053A	HINGE RACK	NYLON 66	1
24	DB61-30478B	SUPT PANEL	SGCC-M,Z, T1.2	1
25	DB66-70015A	GEAR RACK SHUTTER	ABS	1
26	DB66-30129B	BLADE-UP	ABS	1
27	DB66-30127B	BLADE-H	ABS	1
28	DB66-60025A	LINK BLADE-H	ABS	1
29	DB61-300466A	SUPT BLADE-H	ABS	1
30	DB61-50086A	GUIDE RAIL L	ABS	1
31	DB31-10113A	MOTOR STEPPING	MP35	1
32	DB66-30141A	BLADE-V MOTOR	ABS	1
33	DB66-30128A	BLADE-V	ABS	1
34	DB66-60019A	LINK BLADE-V	ABS	1
35	DB61-40209A	HOLDER BLADE-V	ABS	1
36	DB61-50087A	GUIDE-RAIL-R	ABS	1
37	DB61-60087A	BODY BLADE	ABS	1
38	DB38-20261A	CONNECT WIRE	PHDR-10VS	1
39	DB63-10414A	COVER PANEL	ABS	1

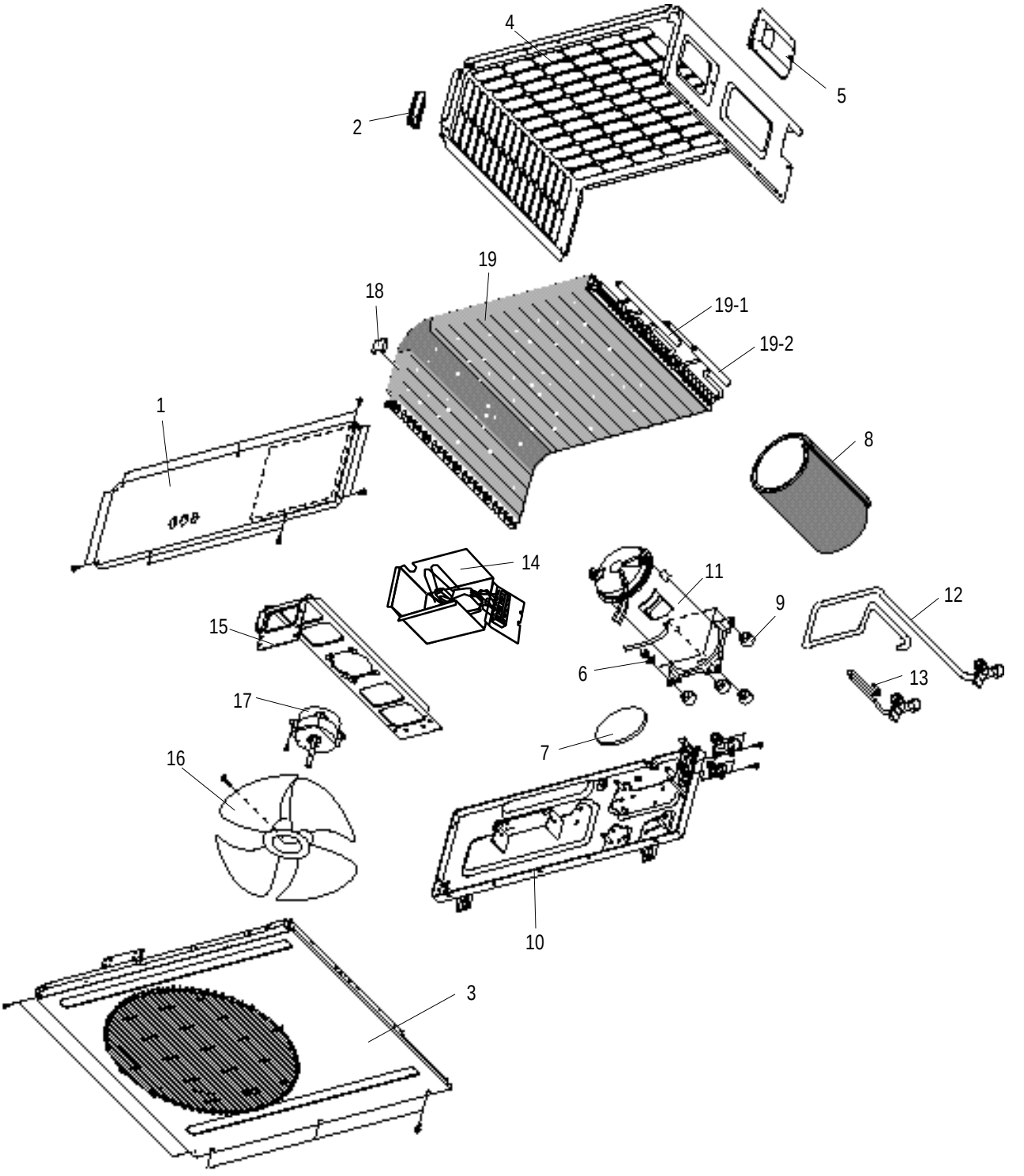
6-1-2 ASS'Y GRILLE INLET



■ Parts List

No	CODE NO	Description	Specification	Q'TY	Remark
1	DB64-10141A	GRILLE INLET	ABS, PEARL COATING	1	
2	DB61-40212B	HOLDER REMOCON	ABS	1	
3	DB92-10312A	ASS'Y BRKT GRILLE L	SECC-P	1	
4	DB92-10313A	ASS'Y BRKT GRILLE L	SECC-P	1	
5	DB33-10014A	MAGNET	MAGNET	2	

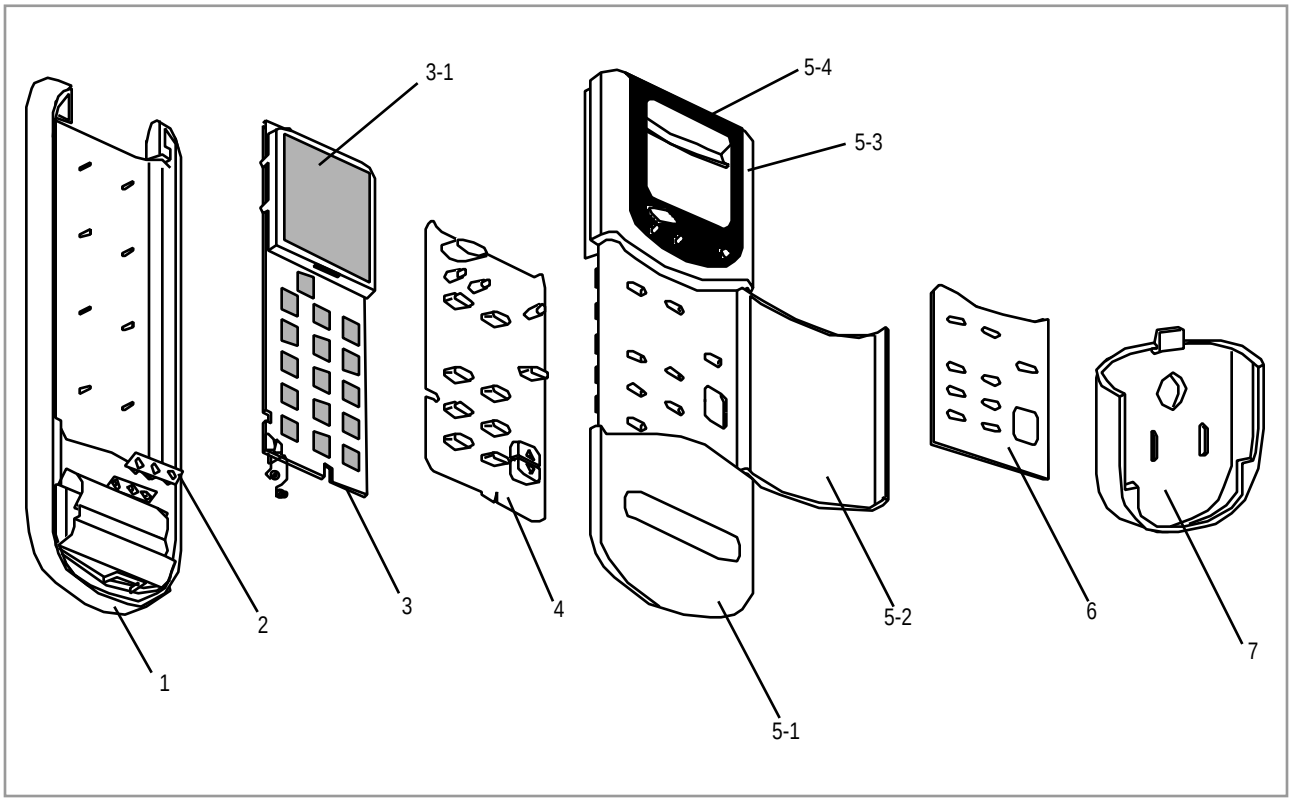
6-2 Outdoor unit



■ Parts List

No.	CODE NO	Description	Specification	Q'TY	Remark
1	DB63-10213C	COVER-TOP	ACRYL, -, -, -, -	1	
2	DB63-10492A	COVER-HANDLE	ABS, T2.0, WHT, -, AP-4350	1	
3	DB90-00035C	ASSY-CABI FRONT	KFH28PV2	1	
4	DB90-10672B	ASSY-CABI BACK	AP-7550	1	
5	DB90-40176A	ASSY-COVER CONTROL	C-PROJECT, HIPS, INSU	1	
6	DB60-30028A	NUT-WASHER	HEX, 2C, M8, ZPC, -, -	4	
7	DB72-50508A	INSULATION-COMP BTM	T10, W180, W180, FELT	1	
8	DB72-60038A	CLOTH-COMP SIDE OUT	T12, -, -, SCROLL	1	
9	DB73-10023A	GROMMET-COMP	EPDM, T41, BLK, ZR28K3	4	
10	DB90-20157K	ASSY-BASE OUT	AP-7550, SC-90073T	1	
11	DB95-10243B	ASSY-COMP	ZR34K3-PFJ, SCROLL	1	
12	DB96-10529C	ASSY-4WAY V/V	KFH28PV2	1	
12-1	DB34-10006C	SWITCH-PRESSURE A	30KG/CM-22KG/CM,	1	
12-2	DB27-10004C	SOLENDLA-V/V	230V, SAGIMOMIYA	1	
13	DB96-10530A	ASSY-CHECK V/V	KFH28PV2	1	
14	DB93-00157A	ASSY-CONTROL OUT	KFH28PV2	1	
14-1	2501-001190	C-OIL	50/4uF, 450V, BK, 63 X 95, 20.6	1	
14-2	DB34-90057C	MAGNET-CONTACTOR	220V/240V, 20A	1	
14-3	DB65-40022E	BOARD-TERMINAL	PHENOL, 12345NL, 7P	1	
14-4	DB90-00060A	ASSY-CONTROL BOX OUT	KFH28PV2	1	
14-5	DB95-90026D	ASSY-SPARK KILLER	PAC	1	
15	DB61-20093A	BASE-MOTOR		1	
16	DB67-50067A	FAN-PROPELLER		1	
17	DB31-10123A	ASSY-MOTOR OUT	ASS'Y	1	
18	DB61-30276A	BRACKET-HOLDER	SGCC-M, Z, T0.8, -, -, -	1	
19	DB96-30242A	ASSY-COND	KFH28PV2, 2X30	1	
19-1	DB96-50130A	ASSY-COLLECT OUT UP	KFH28PV2	1	
19-2	DB96-50129A	ASSY-COLLECTOR LOW	KFH28PV2	1	

6-3 Remote Control

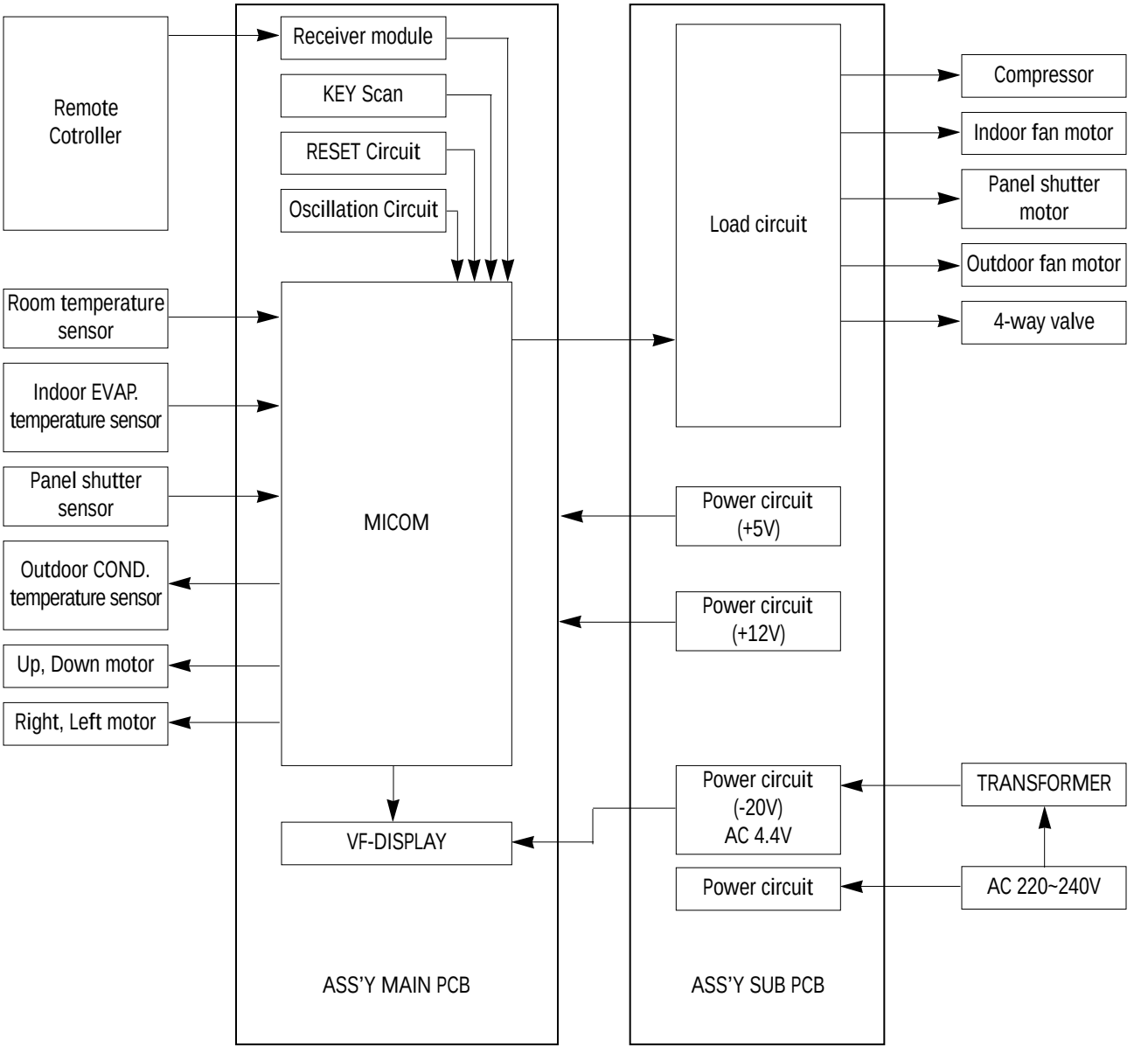


■ Parts List(Remocon)

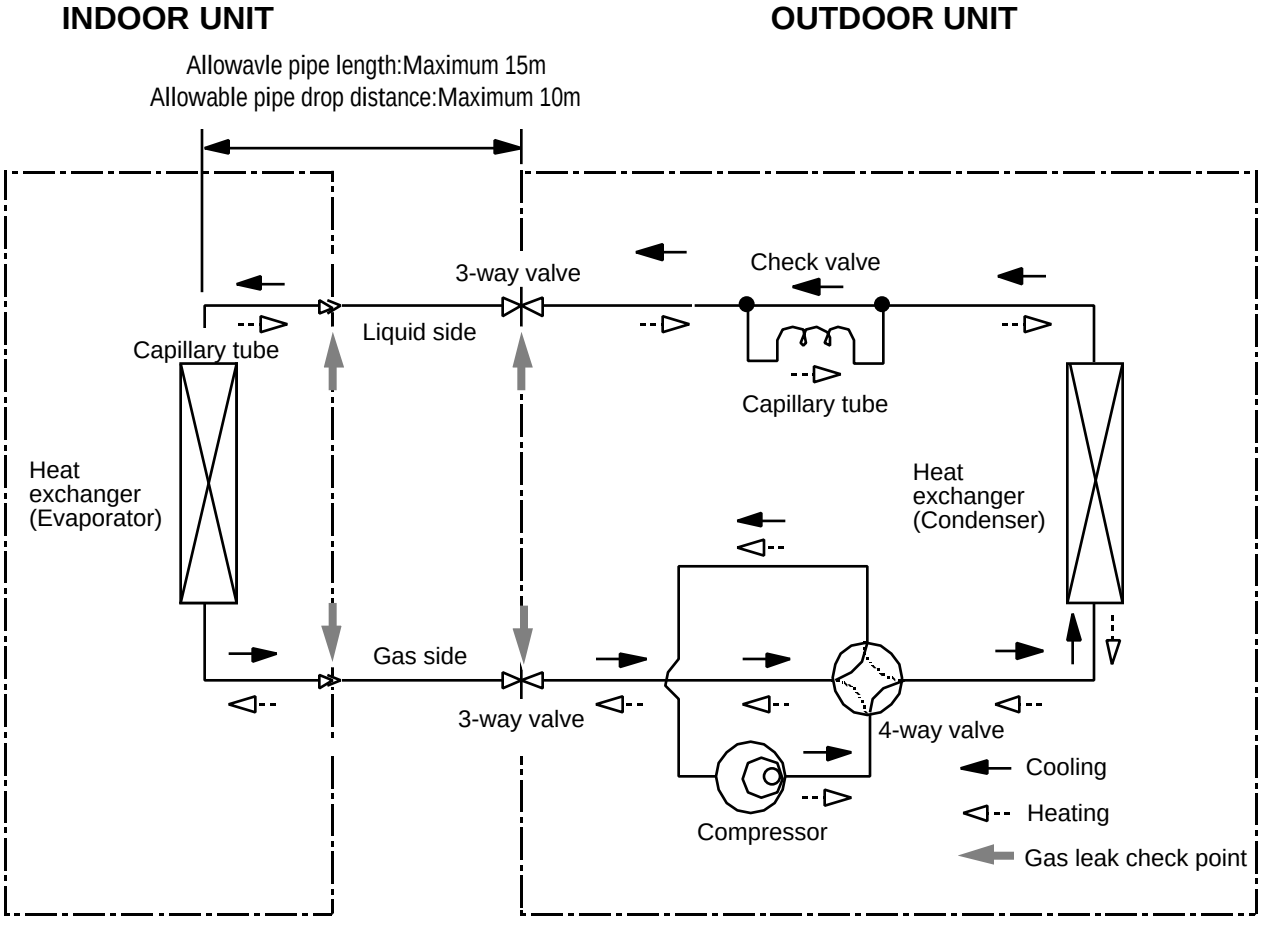
No	CODE NO	Description	Specification	Q'TY	Remark
	DB93-00183A	ASS'Y REMOCON	KFH28PV2	1	
1	DB61-10011A	CASE-REMOCON(LW)	ABS	1	
2	DB73-20025A	RUBBER-BUTTON(B)	NBR	1	
3	DB93-10171A	ASS'Y PCB REMOCON	FR-1 T1.6	1	
3-1	DB07-20034A	LCD		1	
4	DB73-20009G	RUBBER-BUTTON(A)	NBR	1	
5-1	DB61-10020A	CASE-REMOCON(UPP)	ABS	1	
5-2	DB64-20035A	DOOR-REMOCON	ABS	1	
5-3	DB64-40007B	WINDOR-REMOCON	PC	1	
5-4	DB74-10008A	FILTER-REMOCON	PC	1	
6	DB64-40068N	INLAY-REMOCON	ABS	1	
7	DB63-10081A	COVER BATTERY	ABS	1	

7. Block Diagrams

7-1 Micro Computer Block Diagram



7-2 Refrigerating Cycle Block Diagram



* Amount of refilling per extension length of 1m;
When extending the pipe length by more than 5m, 40g of R-22 refrigerant should be refilled per extension length of 1m.

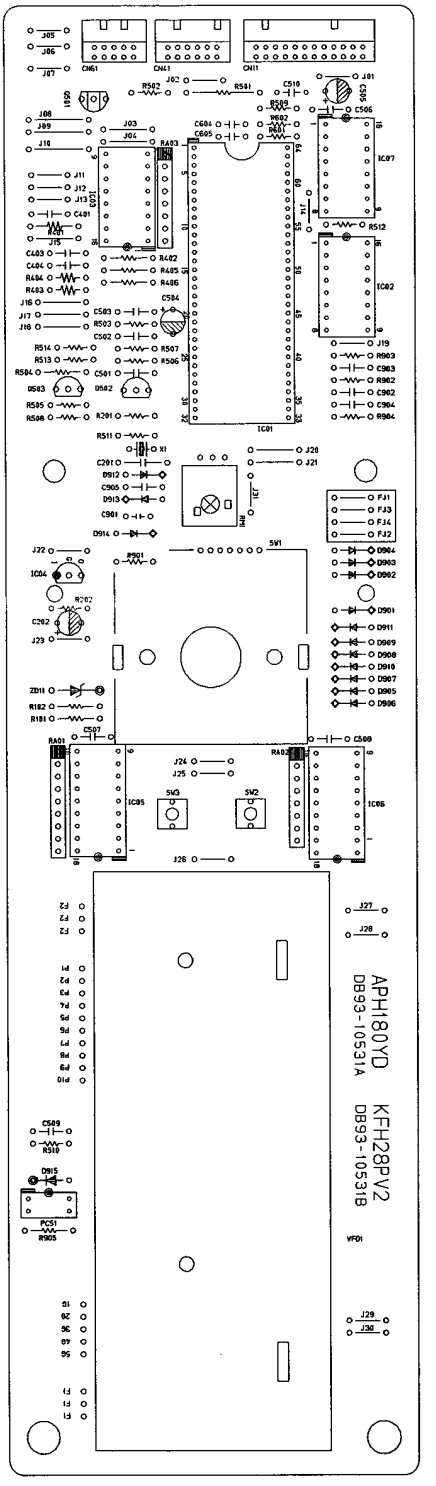
Refrigerating cycle temperature and pressure

Operating Condition		STD Pressure (kg/cm^2G) (GAS SIDE)	Piping Temp.		Use Temp. Condition (°C)			
			T1	T2	Indoor		Outdoor	
					DB	WB	DB	WB
Cooling	Standard	4.5~5.5	40~45	9~12	27	19	35	24
	Max over load	6.5~7.5	50~55	14~18	32	23	43	26
	Low temp	3~4	30~35	1~4	21	16	21	16
Heating	Standard	18.5~20.5	32~36	65~75	20	-	7	6
	Max over load	-	36~40	70~80	27	-	21	16
	Deice	-	28~32	40~45	20	-	2	1

MEMO

8. PCB Diagrams

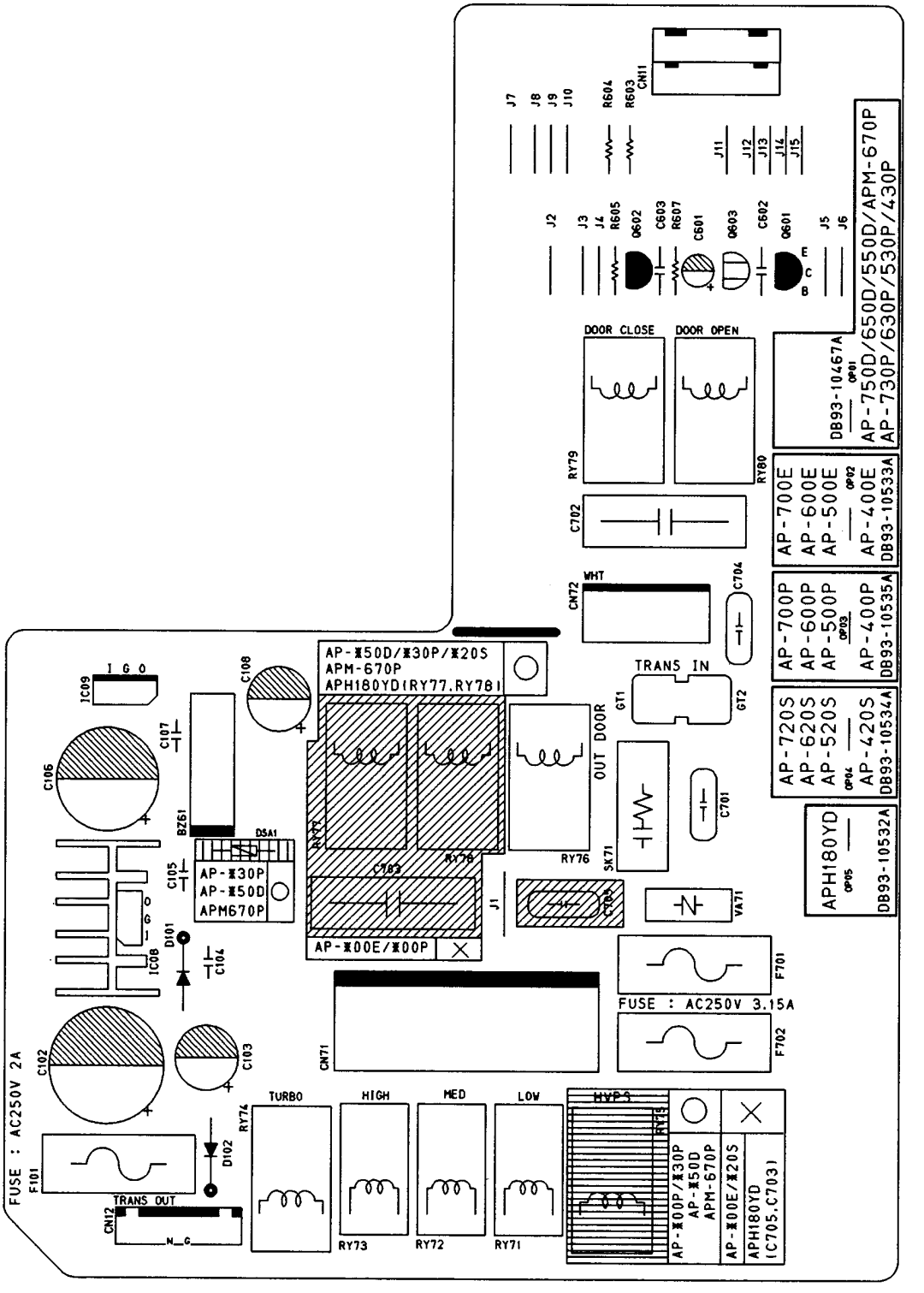
8-1 Ass'y Main PCB (CODE NO : DB93-10531B)



• PART LIST

NO	DESCRIPTION	CODE NO	SPECIFICATION	Q'TY	LOCATION NO
1	VF-DISPLAY		SVR-05LL03	1	VFD1
2	MODULE REMOCON	DB32-50025A	GP1U281R	1	RM1
3	HOLDER-VFD	DB61-40208A	NYLON66	1	VFD1
4	SW-TACT	DE34-20032A	KPT-1115D 6X4.3MM	2	SW2, SW3
5	SW-JOG SHUTTLE	DB34-90076A	SRGPTJ	1	SW1
6	DIODE-SW	0401-000005	1N4148	13	D901, D903-D914
7	DIODE-RECT	0402-000559	1N4002 100V 1A SI	1	D915
8	DIODE-ZENER	A4106-0154	TZP-5.18	1	ZD11
9	R-CARBON	2001-000435	RD 1/8 T 105J	2	R511
10	R-CARBON	2001-000273	RD 1/8 T 104J	2	R505, 506
11	R-METAL FILM	2004-001137	RM 1/8 T 682-F	3	R401, 403, 404
12	R-CARBON	2001-000776	RD 1/2 T 471-J	2	R101, 102
13	R-ARRAY	2011-001178	9E 103J	1	RA01
14	R-ARRAY	2011-001177	8E 103J	2	RA02, 03
15	R-CARBON	2001-000429	RD 1/8 T 102-J	6	R201, 202,509,510,513,514
16	R-CARBON	2001-000003	RD 1/8 TP 331-J	7	R402,405,406,501,507,508,901
17	R-CARBON	2001-000290	RD 1/8 T 103-J	9	R502-504,512,601,602,902-904
18	R-CARBON	2001-000036	RD 1/4 T 331-J	1	R905
19	C-CERAMIC	2202-000780	CK OA 50V T 104-Z	12	C201,401,403,404,501-503,506-508,605,905
20	C-CERAMIC	2202-000127	CK OA 50V T 103-Z	5	C509,C604,902-904
21	C-CERAMIC	2201-000326	CK OA 50V T 222-Z	1	C901
22	C-ELEC	2401-003107	CE 04 C 16V T 470-M	2	C504,505
23	C-ELEC	2401-000598	CE 04 C 25V T 1uF	1	C202
24	TR-GENERAL	0501-000292	KSA708Y	1	Q501
25	TR-GENERAL	0501-000398	KSC945Y	2	Q502,503
26	RESONATOR-CERAMIC	2802-000103	10MHz CST10MTW TC D	1	X1
27	IC-LINEAR	DE13-20017A	ULN2003A	3	IC02,03,07
28	WIRE-SO COPPER	DE39-60001A	P10.6 SN T 52MM	30	J1-30
29	IC-MCU	DB09-10118A	MB89635PSH-	1	IC01
30	IC	DE13-20009A	KA7533	1	IC04
31	IC-DRIVE	DE13-20033A	UDN6118A	2	IC05, 06
32	CONNECTOR-WAFER	3711-003251	S10B-PHDSS	1	CN61
33	CONNECTOR-WAFER	3711-003252	S12B-PHDSS	1	CN41
34	CONNECTOR-WAFER	3711-003246	S24B-PHDSS	1	CN11
35	PCB-MAIN		FR-1 T1.6 W197 L300	1	PCB
36	PHOTO-COUPLER	DB47-90071A	PC817	1	PC51

8-2 Ass'y Power PCB(Code No : DB93-10532B)

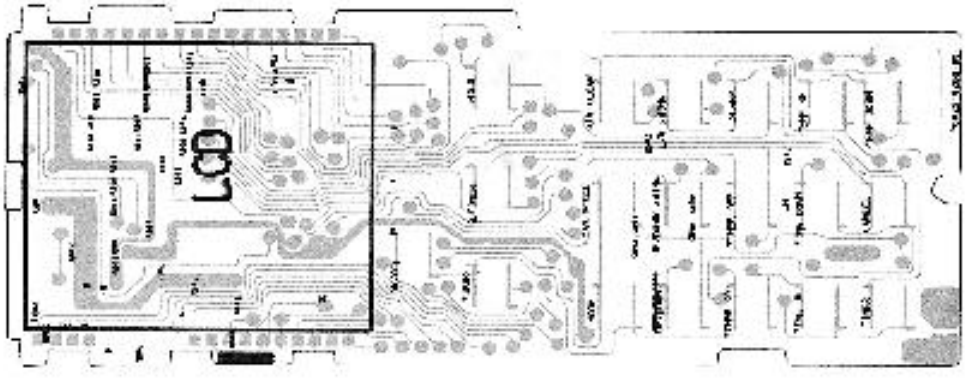


• PART LIST

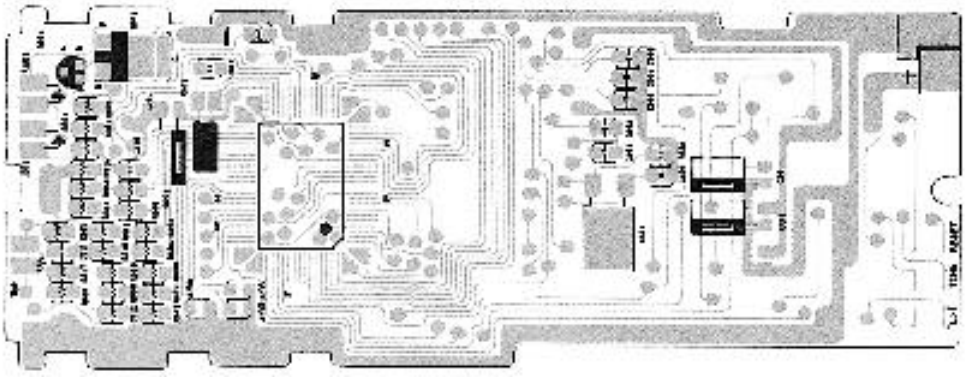
NO	DESCRIPTION	CODE NO	SPECIFICATION	Q'TY	LOCATION NO
1	SCREW-TAPPING	DB60-10100A	PH 3 L6 AB FEFZY	1	IC08
2	HEAT SINK	DB62-30031A	AL6063 16.8 * 23.5*30	1	IC08
3	SPARK-KILLER	DE47-30019A	ESQ-1201	1	SK71
4	R-CARBON	2001-000042	RD 1/4 T 102-J	1	R604, 605
5	R-CARBON	2001-000036	RD 1/4 TP 331-J	1	R607
6	R-CARBON	2001-000065	RD 1/4 T 103-J	1	R603
7	C-FILM	2301-000141	CF 630V T 103-K	1	C704
8	C-FILM	2301-000131	CF 630V T 104-Z	1	C701
9	C-CERAMIC	2202-000780	CK OA 50V T 104-Z	4	C104, 105, 107, 602
10	C-CERAMIC	2202-000127	CK OA 50V T 103-Z	1	C603
11	C-ELEC	2401-001059	CE 04 C 35V T 332-M	1	C102
12	C-ELEC	2401-000303	CE 04 C 25V T 101-M	1	C108
13	C-ELEC	2401-000710	CE 04 C 25V T 222-M	1	C106
14	C-ELEC	2401-001575	CE 04 C 25V T 470-M	1	C601
15	C-ELEC	2401-001412	CE 04 C 35V 471-M	1	C103
16	BUZZER	DE30-20016A	CBE2220BA STICK	1	BZ61
17	RELAY	3501-001042	UT205-12S 250V 3A	6	RY74, RY76-80
18	IC VOLT REGU	DE13-20016A	KA7805A TO 220AB	1	IC09
19	TR-GENERAL	0501-000292	KSA708Y	1	Q603
20	TR-RESISTOR	0504-000201	KSR1002	2	Q601,602
21	IC-VOLT REGU	DE13-20008A	KA7812A TO-220AB	1	IC08
22	PCB-SUB		FR-1 T1.6 W197 L300	1	PCB
23	HOLDR-FUSE	DE47-40024A	FH-51H 7.5A	3	F101, 701, 702
24	FUSE	DE32-10037A	FST 250V 3.15A 20MM	2	F701, 702
25	FUSE	DE32-10034A	FST 250V 2A 20MM	1	F101
26	WIRE-SO COPPER	DE39-60001A	P10.6 SN T 52MM	16	J-15, OP05
27	RELAY	3501-000399	JQ1A-12V	3	RY71-RY73
28	DIODE-RECT	DB47-90067A	1R5NH45	2	D101, 102
29	VARISTOR	1405-000001	INR10D471-10A 470V	1	VA71
30	CONNECTOR-TERMINA	3712-001062	P-520-01	2	GT1, 2
31	CONNECTOR-WAFER	3711-003253	B 18B-PHDSS	1	CN11
32	CONNECTOR-WAFER	3711-003244	B 16P-XL	1	CN71
33	CONNECTOR-WAFER	3711-001082	SMW250-07 WHT	1	CN12
34	CONNECTOR-WAFER	3711-000262	YW396-05VA, WHT	1	CN72

8-3 Ass'y Remote Control PCB(Ass'y Code No : DB93-10171A)

• Parts side



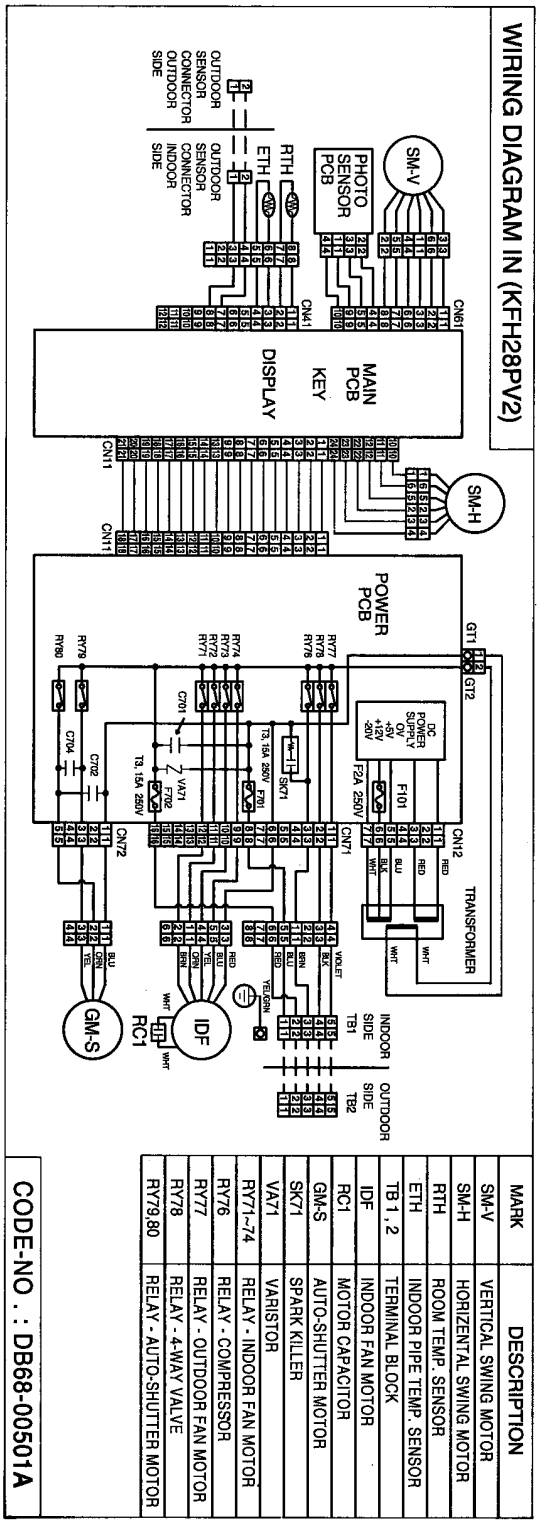
• Copper-clad side



No	CODE NO	Description	Specification	Q'TY	Remark
R501-R507,R514		CHIP RESISTOR	MCR18EZH F 60.4K	8	
R515		CHIP RESISTOR	MCR18EZH F 120K	1	
R508-R513		CHIP RESISTOR	MCR18EZH F 30KF	6	
R601,R602		CHIP RESISTOR	MCR18EZH J 2.0	2	
R517		CHIP RESISTOR	MCR18EZH F 6.8K	1	
R603		CHIP RESISTOR	MCR18EZH J 68	1	
R604		CHIP RESISTOR	MCR18EZH J 1.2K	1	
R516		CHIP RESISTOR	MCR18EZH F 50K	1	
		CHIP RESISTOR	MCR18EZH J 5.6K	1	
C502-C506,C510		CHIP RESISTOR	MCH315A 104Z	6	
C511		CHIP CAPACITOR		1	
C512		CHIP CAPACITOR	MCH315A 103Z	1	
C101,C102		C-ELECTRONIC	SE 47ßfi/6.3V	2	
C508,C509		CHIP CAPACITOR	MCH315A 101K	2	
C507		CHIP CAPACITOR	MCH315A 150K	1	
C501		C-ELECTRONIC	SE 1ßfi/50V	1	
TH01		ROOM THERMISTOR	103AT-2	1	
Q601		CHIP-TR	KSH-29,KSH-29C	1	
Q602		CHIP-TR	C1623-Y	1	
X502		CRYSTAL	455KHz	1	
X501		CRYSTAL	32.768KHz	1	
LE01		IR-LED	CL-1L5EU	1	
LE02		IR-LED	CL-1L5EU	1	
MICOM	DB09-10083A	MICOM	SMC621A	1	
LCD	DB07-20034A	LCD	HLC8707	1	
SW01, SW02		CHIP RESISTOR	MCR18EZH JO.D	2	

9. Wiring Diagrams

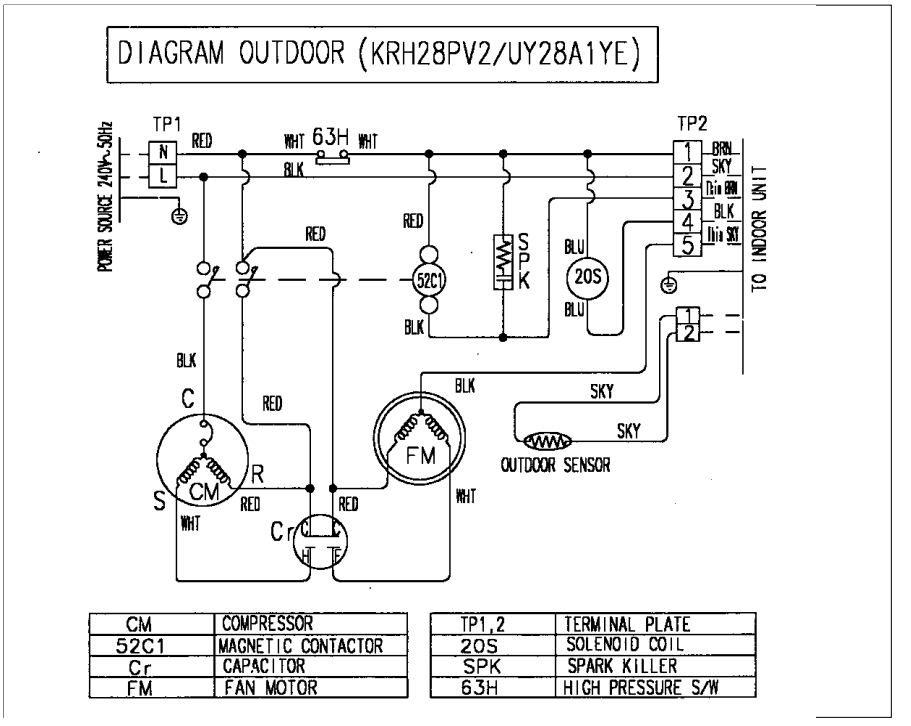
9-1 Indoor Unit



MARK	DESCRIPTION
SM-V	VERTICAL SWING MOTOR
SM-H	HORIZENTAL SWING MOTOR
RTH	ROOM TEMP. SENSOR
ETH	INDOOR PIPE TEMP. SENSOR
TB 1 , 2	TERMINAL BLOCK
IDF	INDOOR FAN MOTOR
RC1	MOTOR CAPACITOR
GM-S	AUTO-SHUTTER MOTOR
SK71	SPARK KILLER
VA71	VARISTOR
RY71~74	RELAY - INDOOR FAN MOTOR
RY76	RELAY - COMPRESSOR
RY77	RELAY - OUTDOOR FAN MOTOR
RY78	RELAY - 4-WAY VALVE
RY79,80	RELAY - AUTO-SHUTTER MOTOR

CODE-NO . : DB68-00501A

9-2 Outdoor Unit



CM	COMPRESSOR
52C1	MAGNETIC CONTACTOR
Cr	CAPACITOR
FM	FAN MOTOR

TP1,2	TERMINAL PLATE
20S	SOLENOID COIL
SPK	SPARK KILLER
63H	HIGH PRESSURE S/W

UPDA TE LOG SHEET				
Application date	Page	Part#	Note(Cause & Solution)	S/Bulletin#

Use this page to keep any special servicing information. (Service Bulletin, etc.)
If only parts number changes, Just change parts number directly on parts list.
And if you need more information, please see the service bulletin

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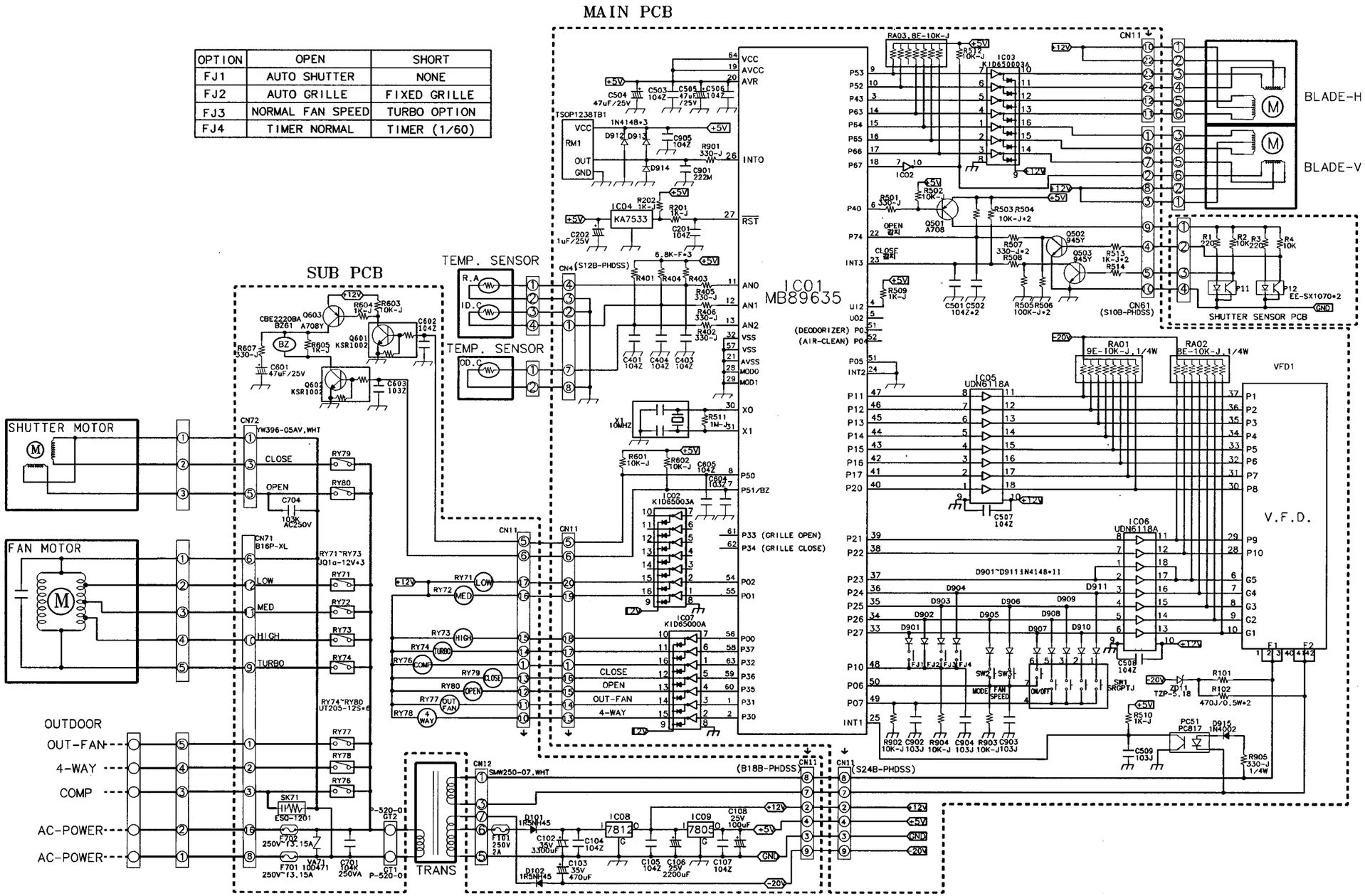
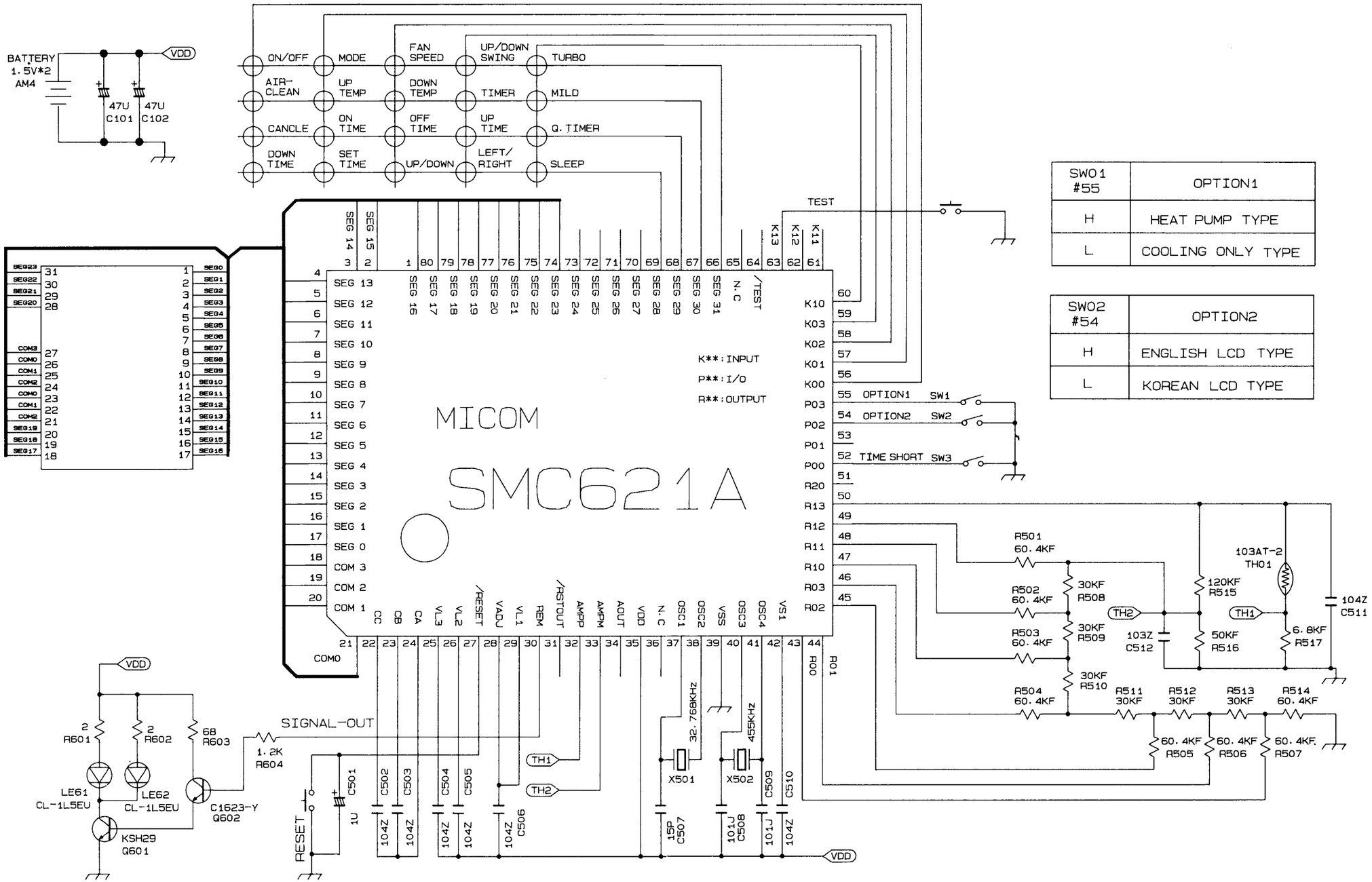
10. Schematic Diagrams

10-1 Indoor Unit

OPTION	OPEN	SHORT
FJ1	AUTO SHUTTER	NONE
FJ2	AUTO GRILLE	FIXED GRILLE
FJ3	NORMAL FAN SPEED	TURBO OPTION
FJ4	TIMER NORMAL	TIMER (1/60)





SW01 #55	OPTION1
H	HEAT PUMP TYPE
L	COOLING ONLY TYPE

SW02 #54	OPTION2
H	ENGLISH LCD TYPE
L	KOREAN LCD TYPE